MISCELLANEOUS ESSAYS.

MISCELLANEOUS ESSAYS,

BY

H. T. COLEBROOKE.

WITH

LIFE OF THE AUTHOR.

BY HIS SON,

SIR T. E. COLEBROOKE.

IN THREE VOLUMES.

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MISCELLANEOUS ESSAYS,

BY

H. T. COLEBROOKE.

A NEW EDITION, WITH NOTES,

BY

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ERRATA TO VOLUME II.

Page 38, line 9, *read* pradípoddyota.
" 43, line 7, *read* Vanśívadana.
" 49, line 14, *read* Utpaliní.
" 50, last line, *read* Maitreya-rakshita.
" 58, line 3 infra, *read* Śeshanága.
" 106, line 28, *read* Bháminí-vilása.
" 112, last line, *read* Aparavaktra. (N. B.)
" 139, line 19 (col. 2), *read* 6+4×5+L.
" 140, line 2 infra, *read* Viparíta-pathyá.
" 145, line 10 (col. 2), *read* Kiríṭa.
" 278, line 11, *read* Kaśyapa.
" 312, lines 9, 16, *read* Paráśara.
" 315, line 26, *read* várttika.
" 338, line 7 infra, *read* Śatánanda.
" 360, line 12, *read* Játakárṇava.

In p. 183 note[2] should have been inclosed in brackets [ ].

In pp. 284, l. 16; 346, l. 4 infr., and 348, l. 6 infr., *Marichi* and *Márichi* should have been corrected to *Máricha*, as Colebrooke himself wrote the title in p. 409, l. 1.

Similarly in p. 298, l. 23; p. 299, ll. 9, 18; p. 301, l. 27; p. 302, l. 7, Jyeshṭhá, Ashádhá, and Bhadrapadá should be read, instead of the wrongly retained readings of the original edition.

MISCELLANEOUS ESSAYS.

I.

ON THE SANSKRIT AND PRÁKRIT LANGUAGES.

[*From the Asiatic Researches*, vol. vii. pp. 199–231. *Calcutta*, 1801. 4to.]

[1] In a treatise on rhetoric, compiled for the use of Máṇikya Chandra, Rájá of Tírabhukti or Tirhút, a brief enumeration of languages used by Hindu poets is quoted from two writers on the art of poetry. The following is a literal translation of both passages.

"Sanskṛita, Prákṛita, Paiśáchí, and Mágadhí, are in short the four paths of poetry. The gods, etc., speak Sanskṛita; benevolent genii, Prákṛita; wicked demons, Paiśáchí; and men of low tribes and the rest, Mágadhí. But sages deem Sanskṛita the chief of these four languages. It is used three ways: in prose, in verse, and in a mixture of both."[1]

"Language, again, the virtuous have declared to be fourfold, Sanskṛita [or the polished dialect], Prákṛita [or the vulgar dialect], Apabhranśa [or jargon], and Miśra [or mixed]. Sanskṛita is the speech of the celestials, framed in grammatical institutes; Prákṛita is similar to it, but manifold as a provincial dialect, and otherwise; and those languages, which are ungrammatical, are spoken in their respective districts."[2]

[1] [I have not identified this passage.]

[2] [This passage occurs in the Kávyádarśa of Daṇḍin, i. 32, 33, but apparently with some variations in the Calcutta edition: "Language, again, men of reputation (*dryḍh*) declare to be fourfold, Sanskrit, Prákrit, Apabhranśa, and Miśra. The divine language has been characterized by the great ṛishis as Sanskrit; the degrees of Prákrit are various, as derived from Sanskrit (*tadbhava*), corresponding with it (*tatsama*), and provincial (*deśí*)."—Vararuchi, the oldest Prákrit

The Paiśáchí seems to be gibberish, which dramatic poets make the demons speak, when they bring these fantastic beings on the stage.[1] The mixture of languages noticed in the second quotation, is that which is employed in dramas, as is expressly said by the same author in a [2] subsequent verse.[2] It is not, then, a compound language, but a mixt dialogue, in which different persons of the drama employ different idioms. Both the passages above quoted are therefore easily reconciled. They, in fact, notice only three tongues. 1. Sanskrit, a polished dialect, the inflections of which, with all its numerous anomalies, are taught in grammatical institutes. This the dramatic poets put into the mouths of gods and of holy personages. 2. Prákrit, consisting of provincial dialects, which are less refined and have a more imperfect grammar. In dramas it is spoken by women, benevolent genii, etc. 3. Mágadhí, or Apabhranśa, a jargon, destitute of regular grammar.[3] It is used by the vulgar, and varies in different districts. The poets accordingly introduce into the dialogue of plays a provincial jargon, spoken by the lowest persons of the drama.[4]

The languages of India are all comprehended in these three

grammarian, divides the Prákrit dialects into four, Prákrit proper, Paiśáchí, Mágadhí, and S'auraseni. Later writers continually increase the number, see Lassen, *Instit. Linguæ Pracriticæ*, pp. 2-38; Muir's *Sansk. Texts*, ii. 2nd ed. pp. 34-53.]

[1] [No existing drama, I believe, has any specimens of the Paiśáchí; but the Vṛihat Kathá is said to have been originally composed in that dialect.]

[2] [*Kávyádarśa*, i. 37.]

[3] [For a fuller account of Mágadhí and Apabhranśa, see Lassen's *Inst. Linguæ Pracr.*, pp. 391-410, 435-438, and pp. 449-484.]

[4] Sanskṛita is the passive participle of a compound verb, formed by prefixing the preposition *sam* to the crude verb *kṛi*, and by interposing the letter *s* when this compound is used in the sense of embellishment. Its literal meaning then is "adorned"; and when applied to a language it signifies "polished." Prákṛita is a similar derivative from the same crude verb, with *pra* prefixed: the most common acceptation of this word is "outcast, or man of the lowest class"; as applied to a language it signifies "vulgar."—[For Hemachandra's derivation of the word see *infrà* p. [66].—Apabhranśa is derived from *bhraś*, "to fall down": it signifies a word, or dialect, which falls off from correct etymology. Grammarians use Sanskṛita as signifying "duly formed or regularly inflected;" and Apabhranśa for false grammar.

classes. The first contains Sanskrit, a most polished tongue, which was gradually refined until it became fixed in the classic writings of many elegant poets, most of whom are supposed to have flourished in the century preceding the Christian era. It is cultivated by learned Hindus throughout India, as the language of science and of literature, and as the repository of their law, civil and religious. [3] It evidently draws its origin (and some steps of its progress may even now be traced) from a primeval tongue, which was gradually refined in various climates, and became Sanskrit in India, Pahlaví[1] in Persia, and Greek on the shores of the Mediterranean.[2] Like other very ancient languages, Sanskrit abounds in inflections, which are, however, more anomalous in this than in the other languages here alluded to; and which are even more so in the obsolete dialect of the Vedas, than in the polished speech of the classic poets. It has nearly shared the fate of all ancient tongues, and is now become almost a dead language; but there seems no good reason for doubting that it was once universally spoken in India. Its name, and the reputed difficulty of its grammar, have led many persons to imagine that it has been refined by the concerted efforts of a few priests, who set themselves about inventing a new language; not, like all other tongues, by the gradually improved practice of good writers and polite speakers. The exquisitely refined system by which the grammar of Sanskrit is taught, has been mistaken for the refinement of the language itself. The rules have been supposed to be anterior to the practice, but this supposition is

[1] [The oldest form of the Iranian language is the Zend, which is found in the Gáthá dialect, and in a more modern form in the ancient Bactrian or classical language of the Zendavesta. Besides these, we have the language of the cuneiform inscriptions of the Achæmenian dynasty,—the Pahlaví of the Sassanian dynasty, which is largely mixed with a Semitic element, and the Pársí, which forms the basis of modern Persian; this last language chiefly differing from it in the large amount of adopted Arabic words.]

[2] [More correctly we may say that the primeval tongue divided into two great branches, the first represented by the German, Lithuanian, and Slavonic tongues; and the second, on the one hand, by the Keltic, Italian, and Greek, and, on the other, by the Iranian and Sanskrit.]

gratuitous. In Sanskrit, as in every other known tongue, grammarians have not invented etymology, but have only contrived rules to teach what was already established by approved practice.

There is one peculiarity of Sanskrit compositions which may also have suggested the opinion that it could never be a spoken language. I allude to what might be termed the euphonical orthography of Sanskrit. It consists in extending to syntax the rules for the permutation of letters in etymology. Similar rules for avoiding incompatible sounds in compound terms exist in all languages; this is sometimes effected by a deviation from orthography in the pronuncia[4]tion of words; sometimes by altering one or more letters to make the spelling correspond with the pronunciation. These rules have been more profoundly investigated by Hindu grammarians than by those of any other nation; and they have completed a system of orthography which may be justly termed euphonical. They require all compound terms to be reduced to this standard, and Sanskrit authors, it may be observed, delight in compounds of inordinate length: the whole sentence, too, or even whole periods, may, at the pleasure of the author, be combined like the elements of a single word, and good writers generally do so. In common speech this could never have been practised. None but well-known compounds would be used by any speaker who wished to be understood, and each word would be distinctly articulated independently of the terms which precede and follow it. Such, indeed, is the present practice of those who still speak the Sanskrit language; and they deliver themselves with such fluency, as is sufficient to prove that Sanskrit may have been spoken in former times with as much facility as the contemporary dialects of the Greek language, or the more modern dialects of the Arabic tongue. I shall take occasion again to allude to this topic, after explaining at large what are, and by whom were composed, those grammatical institutes, in which the Sanskrit

language is framed, according to the author above quoted; or by which (for the meaning is ill-conveyed by a literal translation) words are correctly formed and inflected.

Páṇini, the father of Sanskrit grammar, lived in so remote an age,[1] that he ranks among those ancient sages whose fabulous history occupies a conspicuous place in the Puráṇas, or Indian theogonies.[2] The name is a patro[5]nymic, indicating his descent from Paṇin;[3] but, according to the Pauráṇika legends, he was grandson of Devala, an inspired legislator. Whatever may be the true history of Páṇini, to him the Sútras, or succinct aphorisms of grammar, are attributed by universal consent: his system is grounded on a profound investigation of the analogies in both the regular and the anomalous inflections of the Sanskrit language. He has combined those analogies in a very artificial manner; and has thus compressed a most copious etymology into a very narrow compass. His precepts are indeed numerous,[4] but they have been framed with the utmost conciseness; and this great brevity is the result of very ingenious methods which have been contrived for this end, and for the purpose of assisting the student's memory. In Páṇini's system, the mutual relation of all the parts marks that it must have been completed by its author: it certainly bears internal evidence of its having been accomplished by a single effort, and even the corrections which are needed cannot be interwoven with the text. It

[1] [Páṇini's date is still an unsettled question. It has been usually fixed, on confessedly uncertain grounds, about B.C. 350; but Prof. Goldstücker, in his *Páṇini, his Place in Sanskrit Literature*, maintains that he may even have preceded Buddha.]

[2] Every Puráṇa treats of five subjects: the creation of the universe, its progress, and the renovation of worlds; the genealogy of gods and heroes; chronology, according to a fabulous system; and heroic history, containing the achievements of demi-gods and heroes. Since each Puráṇa contains a cosmogony, with mythological and heroic history, the works which bear that title may not inaptly be compared to the Grecian theogonies.

[3] [According to the *Siddhánta Kaumudí* (i. 542), Páṇini was the descendant of Páṇina, who again was the descendant of Paṇin. His mother's name was Dákshí. (See *Páṇini, his Place in Sanskrit Lit.*, p. 211.)]

[4] Not fewer than 3996.

must not be hence inferred, that Páṇini was unaided by the labours of earlier grammarians. In many of his precepts he cites the authority of his predecessors,[1] sometimes for a deviation from a general rule, often for a grammatical canon which has universal cogency. He has even employed some technical terms without defining them,[2] because, as his commentators remark, those terms were already introduced by earlier grammarians.[3] None of the [6] more ancient works, however, seem to be now extant: being superseded by his, they have probably been disused for ages, and are now perhaps totally lost.[4]

A performance such as the Páṇiníya grammar must inevitably contain many errors. The task of correcting its inaccuracies has been executed by Kátyáyana,[5] an inspired saint and lawgiver, whose history, like that of all the Indian sages, is involved in the impenetrable darkness of mythology. His annotations, entitled Vártikas,[6] restrict those among the Páṇiníya rules which are too vague, enlarge others which are too limited, and mark numerous exceptions which had escaped the notice of Páṇini himself.

The amended rules of grammar have been formed into memorial verses by Bhartṛihari,[7] whose metrical aphorisms, entitled Káriká, have almost equal authority with the precepts

[1] S'ákalya, Gárgya, Kás'yapa, Gálava, S'ákaṭáyana, and others [viz. Ápis'ali, Chákravarmaṇa, Bháradwája, Senaka, Sphoṭáyana, and the so-called eastern and northern grammarians].

[2] [See this point discussed in *Páṇini, his Place in S. L.*, pp. 162–168.]

[3] In a few instances he quotes former grammars to refute them.

[4] Definitions of some technical terms, together with grammatical axioms, are also cited from those ancient works in the commentaries on Páṇini. They are inserted in a compilation entitled *Paribháshá*, which will be subsequently noticed. The various original authorities of Sanskrit grammar, as enumerated in a memorial verse, are eight in number, viz., Indra, Chandra, Kás'akṛitsna, Ápis'ali, S'ákaṭáyana, Páṇini, Amara, and Jinendra.

[5] This name likewise is a patronymic [viz. the descendant of Kati].

[6] [More properly *várttikas*, as derived from *vṛitti*, 'a commentary.']

[7] [Bhartṛihari wrote the Vákyapadíya, which is sometimes called the Harikáriká; but the Kárikás quoted in the Mahábháshya are not by him. Prof. Goldstücker (*l. c.* pp. 93-105) considers that some of these are by Kátyáyana, others by Patanjali himself, others by some third author.]

of Páṇini and emendations of Kátyáyana. If the popular traditions concerning Bhartṛihari be well founded, he lived in the century preceding the Christian era;[1] for he is supposed to be the same with the brother of Vikramáditya, and the period when this prince reigned at Ujjayiní is determined by the date of the Samvat era.

The studied brevity of the Páṇiníya Sútras renders [7] them in the highest degree obscure. Even with the knowledge of the key to their interpretation, the student finds them ambiguous. In the application of them when understood, he discovers many seeming contradictions; and, with every exertion of practised memory, he must experience the utmost difficulty in combining rules dispersed in apparent confusion through different portions of Páṇini's eight lectures. A commentary was therefore indispensably requisite. Many were composed by ancient grammarians to elucidate the text of Páṇini. A most copious one on the emendations of his rules was compiled in very ancient times by an uncertain author. This voluminous work, known by the title of Mahábháshya, or the great commentary, is ascribed to Patanjali, a fabulous personage, to whom mythology has assigned the shape of a serpent.[2] In this commentary almost every rule is examined at great length. All possible interpretations are proposed: and the true sense and import of the rule are deduced through a tedious train of argument, in which all foreseen objections are considered and refuted, and the wrong interpretations of the text, with all the arguments which can be invented to support them, are obviated or exploded.

Voluminous as it is, the Mahábháshya has not exhausted the subject on which it treats. Its deficiencies have been

[1] A beautiful poem has been composed in his name, containing moral reflections, which the poet supposes him to make on the discovery of his wife's infidelity. It consists of either three or four S'atakas, or centuries of couplets.

[2] [Patanjali was one of the Eastern grammarians. Prof. Goldstücker has shown good reasons for believing that he wrote part of his commentary between 140 and 120 B.C. (*l. c.* pp. 229-234).]

supplied by the annotations of modern grammarians. The most celebrated among these scholiasts of the Bháshya is Kaiyaṭa, a learned Kashmirian. His annotations are almost equally copious with the commentary itself. Yet they, too, are loaded by numerous glosses; among which the old and new *Vivaraṇas* are most esteemed.

The difficulty of combining the dispersed rules of grammar, to inflect any one verb or noun through all its variations, renders further aid necessary. This seems to have [8] been anciently afforded in vocabularies, one of which exhibited the verbs classed in the order implied by the system of Páṇini, the other contained nouns arranged on a similar plan. Both probably cited the precepts which must be remembered in conjugating and declining each verb and noun. A catalogue of verbs, classed in regular order, but with few references to the rules of etymology, is extant, and is known by the title Dhátupáṭha.[1] It may be considered as an appendix to the grammar of Páṇini; and so may his treatise on the pronunciation of vocal sounds,[2] and the treatise of Yáska on obsolete words and acceptations peculiar to the Veda.[3] A numerous class of derivative nouns, to which he has only alluded, have been reduced to rule, under the head of Uṇádi, or the termination *u*, etc.;[4] and the precepts respecting the gender of nouns have been, in like manner, arranged in Sútras, which are formed on the same principles with Páṇini's rules, and which are considered as almost equally ancient. Another supplement to his grammar is entitled Gaṇapáṭha, and contains lists of words comprehended in various grammatical rules, under the designation of some single word, with the term "etc." annexed to it. These supplements are due to

[1] [Edited by Prof. Westergaard in his *Radices Linguæ Sanscritæ*, 1841.]

[2] [For the tract on pronunciation called S'ikshá, often called a Vedánga, see Professor Müller's *Anc. Sansk. Lit.*, p. 145.]

[3] [Yáska was probably anterior to Páṇini; his Nirukta has been edited by Prof. Roth, Göttingen, 1852.]

[4] [The best edition of the Uṇádi Sútras is that by Prof. Aufrecht, with Ujjwaladatta's Commentary, London, 1859.]

various authors. The subject of gender alone has been treated by more than one writer reputed to be inspired; namely, by Kátyáyana, Gobhila, and others.

These subsidiary parts of the Páṇiníya grammar do not require a laboured commentary; excepting only the catalogue of verbs, which does need annotation; and which is, in truth, a proper groundwork for a complete review of all the rules of etymology that are applicable to each verb.[1] [9] The Vṛitti Nyása, a very celebrated work, is, I believe, a commentary of this sort.[2] It is mentioned by Maitreya Rakshita, the author of the Dhátu Pradípa, as the work chiefly consulted by him in compiling his brief annotations on the Dhátupáṭha. A very voluminous commentary on the catalogue of verbs was compiled under the patronage of Sáyaṇa, minister of a chieftain named Bukkaráya, and is entitled Mádhavíya Vṛitti. It thoroughly explains the signification and inflection of each verb; but at the same time enters largely into scholastic refinements on general grammar.

Such vast works as the Mahábháshya and its scholia, with the voluminous annotations on the catalogue of verbs, are not adapted for general instruction. A conciser commentary must have been always requisite. The best that is now extant is entitled the Káśiká Vṛitti, or commentary composed at Varáṇasí. The author, Jayáditya,[3] in a short preface explains his design: "to gather the essence of a science dispersed in the early com-

[1] The number of verbal roots amounts to 1750 nearly; exclusive of many obsolete words omitted in the Dhátupáṭha, but noticed in the Sútras as the roots of certain derivatives. The crude verbs, however, are more numerous, because many roots, containing the same radical letters, are variously conjugated in different senses. The whole number of crude verbs separately noticed in the catalogue exceeds three thousand. From each of these are deduced many compound verbs, by prefixing one or more prepositions to the verbal root. Such compounds often deviate very widely in their signification, and some even in their inflections, from the radical verb. The derivative verbs, again, are numerous; such as causals, frequentatives, etc. Hence it may be readily perceived how copious this branch of grammar must be.

[2] I have not yet had an opportunity of inspecting either this or its gloss. It has been described to me as a commentary on the Kás'iká Vṛitti.—[See p. [40].

[3] [He is also called Vámana.]

mentaries, in the Bháshya, in copious dictionaries of verbs and of nouns, and in other works." He has well fulfilled the task which he undertook. His gloss explains in perspicuous language the meaning and application of each rule; he adds exam[10]ples, and quotes, in their proper places, the necessary emendations from the Várttikas and Bháshya. Though he never deviates into frivolous disquisitions nor into tedious reasoning, but expounds the text as succinctly as could consist with perspicuity, his work is nevertheless voluminous; and yet, copious as it is, the commentaries on it, and the annotations on its commentaries, are still more voluminous. Amongst the most celebrated is the Padamanjarí of Haradatta Miśra, a grammarian whose authority is respected almost equally with that of the author on whose text he comments. The annotators on this, again, are numerous; but it would be useless to insert a long list of their names, or of the titles of their works.

Excellent as the Káśiká Vṛitti undoubtedly is, it partakes of the defects which have been imputed to Páṇini's text. Following the same order in which the original rules are arranged, it is well adapted to assist the student in acquiring a critical knowledge of the Sanskrit tongue. But for one who studies the rudiments of the language a different arrangement is requisite, for the sake of bringing into one view the rules which must be remembered in the inflections of one word, and those which must be combined even for a single variation of a single term. Such a grammar has been compiled within a few centuries past by Rámachandra, an eminent grammarian. It is entitled Prakriyá Kaumudí.[1] The rules are Páṇini's, and the explanation of them is abridged from the ancient commentaries; but the arrangement is wholly different. It proceeds from the elements of writing to definitions; thence to orthography: it afterwards exhibits the inflections of nouns according to case, number, and gender; notices the indeclinables; and proceeds to the uses of the cases. It subjoins the rules of

[1] [See Prof. Aufrecht's Bodleian Catalogue, p. 350 *b*.]

apposition, by which compound terms are formed; the etymology of patronymics and other [11] derivatives from nouns; and the reduplication of particles, etc. In the second part it treats of the conjugation of verbs arranged in ten classes; to these primitives succeed derivative verbs, formed from verbal roots or from nouns. The rules concerning different voices follow; they are succeeded by precepts regarding the use of the tenses; and the work concludes with the etymology of verbal nouns, gerunds, supines, and participles. A supplement to it contains the anomalies of the dialect in which the Veda is composed.

The outline of Páṇini's arrangement is simple; but numerous exceptions and frequent digressions have involved it in much seeming confusion. The two first lectures (the first section especially, which is in a manner the key of the whole grammar) contain definitions; in the three next are collected the affixes, by which verbs and nouns are inflected. Those which appertain to verbs occupy the third lecture: the fourth and fifth contain such as are affixed to nouns. The remaining three lectures treat of the changes which roots and affixes undergo in special cases, or by general rules of orthography, and which are all effected by the addition or by the substitution of one or more elements.[1] The apparent simplicity of the design vanishes in the perplexity of the structure. The endless pursuit of exceptions and of limitations so disjoins the general precepts, that the reader cannot keep in view their intended connexion and mutual relation. He wanders in an intricate maze, and the clew of the labyrinth is continually slipping from his hands.

The order in which Rámachandra has delivered the rules of grammar is certainly preferable; but the Sútras of Páṇini, thus detached from their context, are wholly unin[12]telligible. Without the commentator's exposition, they are indeed what Sir William Jones has somewhere termed them, "dark as the

[1] Even the expunging of a letter is considered as the substitution of a blank.

darkest oracle." Even with the aid of a comment, they cannot be fully understood until they are perused with the proper context. Notwithstanding this defect, Bhaṭṭojí Díkshita,[1] who revised the Kaumudí, has for very substantial reasons adhered to the Páṇiníya Sútras. That able grammarian has made some useful changes in the arrangement of the Prakriyá; he has amended the explanation of the rules, which was in many places incorrect or imperfect; he has remedied many omissions, has enlarged the examples, and has noticed the most important instances where the elder grammarians disagree, or where classical poets have deviated from the strict rules of grammar. This excellent work is entitled Siddhánta Kaumudí. The author has very properly followed the example of Rámachandra, in excluding all rules that are peculiar to the obsolete dialect of the Veda, or which relate to accentuation; for this also belongs to the Veda alone. He has collected them in an appendix to the Siddhánta Kaumudí; and has subjoined, in a second appendix, rules concerning the gender of nouns. The other supplements of Páṇini's grammar are interwoven by this author with the body of his work.

The Hindus delight in scholastic disputation. Their grammarians indulge this propensity as much as their lawyers and their sophists.[2] Bhaṭṭojí Díkshita has provided an ample store of controversy in an argumentative commentary on his own grammar. This work is entitled [13] Prauḍha Manoramá. He also composed a very voluminous commentary on the eight lectures of Páṇini, and gave it the title of Śabda Kaustubha. The only portion of it I have yet seen reaches no further than to the end of the first section of Páṇini's first lecture. But this is so diffusive, that, if the whole have been executed on a similar plan, it must triple the ponderous volume

[1] Descendants of Bhaṭṭojí in the fifth or sixth degree are, I am told, now living at Benares. He must have flourished, then, between one and two centuries ago.

[2] Many separate treatises on different branches of general grammar are very properly considered as appertaining to the science of logic.

of the Mahábháshya itself. I have reason, however, for doubting that it was ever completed.

The commentaries on the Siddhánta Kaumudí and Manoramá are very numerous. The most celebrated shall be here briefly noticed. 1. The Tattwa Bodhiní expounds the Siddhánta: it is the work of Jnánendra Saraswatí, an ascetic, and the pupil of Vámanendra Swámí. 2. The Śabdendu Śekhara is another commentary on Bhaṭṭojí's grammar. It was composed by a successor, if not a descendant, of that grammarian. An abridgment of it, which is very generally studied, is the work of Nágeśa, son of Śiva Bhaṭṭa and pupil of Hari Díkshita. He was patronized, as appears from his preface, by the proprietor of Śṛingavera Pura.[1] Though called an abridgment, this Laghu Śabdendu is a voluminous performance. 3. The Laghu Śabdaratna is a commentary on the Manoramá of Bhaṭṭojí Díkshita, by the author's grandson, Hari Díkshita. This work is not improperly termed an abridgment, since it is short in comparison with most other commentaries on grammar. A larger performance on the same topics, and with the same title of Śabda Ratna, was composed by a professor of this school. 4. Bála Śarman Págondíya, who is either fourth or fifth in succession from Bhaṭṭojí, as professor of grammar at Benares, has written commentaries on the Kaustubha, Śabda Ratna, and [14] Śabdendu Śekhara. His father, Baidyanátha Bhaṭṭa, largely annotated the Paribháshendu Śekhara of Nágeśa Bhaṭṭa, which is an argumentative commentary on a collection of grammatical axioms and definitions cited by the glossarists of Páṇini. This compilation, entitled Paribháshá, has also furnished the text for other controversial performances bearing similar titles.

While so many commentaries have been written on the Siddhánta Kaumudí, the Prakriyá Kaumudí has not been neglected. The scholiasts of this, too, are numerous. The

[1] A town on the Ganges, marked Singhore, in Rennel's map. It is situated above Iláhábád. [Cf. Bodleian Cat., p. 165.]

most known is Krishṇa Paṇḍita; and his work has been abridged by his pupil Jayanta, who has given the title of Tattwa Chandra to a very excellent compendium.[1] On the other hand, Krishṇa Paṇḍita has had the fate common to all noted grammarians, since his work has employed a host of commentators who have largely commented on it.

The Kaumudís, independently even of their numerous commentaries, have been found too vast and intricate for young students. Abridgments of the Siddhánta Kaumudí have been therefore attempted by several authors with unequal degrees of success. Of three such abridgments one only seems to deserve present notice. It is the Madhya Kaumudí, and is accompanied by a similar compendium of annotations, entitled Madhya Manoramá. The name indicates, that it holds a middle place between the diffuse original and the jejune abstracts called Laghu Kaumudí, etc. It contains such of Páṇini's rules as are most universal, and adds to each a short but perspicuous exposition. It omits only the least common exceptions and limitations.

[15] When Sanskrit was the language of Indian courts, and was cultivated not only by persons who devoted themselves to religion and literature, but also by princes, lawyers, soldiers, physicians, and scribes (in short, by the first three tribes, and by many classes included in the fourth), an easy and popular grammar must have been needed by persons who could not waste the best years of their lives in the study of words. Such grammars must always have been in use; those, however, which are now studied are not, I believe, of very ancient date. The most esteemed is the Sáraswata, together with its commentary named Chandriká. It seems to have been formed on one of the Kaumudís, by translating Páṇini's rules into language that is intelligible independently of the

[1] Finished by him, as appears from a postscript to the book, in the year 1687 of the Samvat era. Though he studied at Benares, he appears to have been born on the banks of the Tapatí, a river marked Taptee in Rennel's map.

gloss, and without the necessity of adverting to a different context.

Another popular grammar, which is in high repute in Bengal, is entitled Mugdhabodha, and is accompanied by a commentary. It is the work of Vopadeva, and proceeds upon a plan grounded on that of the Kaumudís; but the author has not been content to translate the rules of Páṇini and to adopt his technical terms. He has, on the contrary, invented new terms and contrived new abbreviations. The same author likewise composed a metrical catalogue of verbs alphabetically arranged. It is named Kavikalpadruma, and is intended as a substitute for the Dhátupáṭha.

The chief inconvenience attending Vopadeva's innovation is, that commentaries and scholia, written to elucidate poems and works of science, must be often unintelligible to those who have studied only his grammar, and that the writings of his scholars must be equally incomprehensible (wherever a grammatical subject is noticed) to the students of the Páṇiníya. Accordingly the Paṇḍits of Bengal are cut off, in a manner, from communication on grammatical topics with the learned of other provinces in India. Even [16] etymological dictionaries, such as the commentaries on the metrical vocabularies, which I shall next proceed to mention, must be unintelligible to them.

It appears from the prefaces of many different grammatical treatises, that works entitled Dhátu and Náma Páráyaṇa were formerly studied. They must have comprehended, as their title implies, "the whole of the verbs and nouns" appertaining to the language; and, since they are mentioned as very voluminous, they must probably have contained references to all the rules applicable to every single verb and noun. Haradatta's explanation of the title confirms this notion. But it does not appear that any work is now extant under this title. The Dhátupáṭha, with its commentaries, supplies the place of the Dhátupáráyaṇa. A collection of dictionaries and vocabularies, in like manner, supplies the want of the Náma-

páráyaṇa. These then may be noticed in this place as a branch of grammar.

The best and most esteemed vocabulary is the Amara Kosha. Even the bigotry of Śankara Áchárya spared this, when he proscribed the other works of Amara Sinha.[1] Like most other Sanskrit dictionaries, it is [17] arranged in verse to aid the memory. Synonymous words are collected into one or more verses, and placed in fifteen different chapters, which treat of as many different subjects. The sixteenth contains a few homonymous terms, arranged alphabetically, in the Indian manner, by the final consonants. The seventeenth chapter

[1] Amara Sinha was an eminent poet, and one of the nine gems (for so these poets were called) who were the ornament of Vikramáditya's Court. Unfortunately he held the tenets of a heterodox sect, and his poems are said to have perished in the persecutions fomented by intolerant philosophers against the persons and writings of both Jainas and Bauddhas. The persecution, instigated by S'ankara and Udayana Áchárya, was enforced, perhaps from political motives, by princes of the Vaishṇava and S'aiva sects, who compelled the Bauddha monarchs to retire from Hindustán, and to content themselves with their dominions of Lásaṭa and Bhoṭa. It would be curious to investigate the date of this important revolution. The present conjecture (for it is little more than mere conjecture) is partly founded upon some acknowledgments made by Paṇḍits, who confess that S'ankara and Udayana persecuted the heterodox sects and proscribed their books; and partly on the evidence of the engraved plate found at Mudgagiri, and of the inscription on the pillar found at Badál (see As. Res. vol. i. p. 123 and 133), from which it appears that Devapála Deva belonged to the sect of Buddha, and that he reigned over Bengal and Karṇáṭa as well as Lásaṭa and Bhoṭa, and had successfully invaded Kamboja, after traversing as a conqueror the Vindhya range of mountains. His descendants, as far as the fourth generation, governed a no less extensive empire; as appears from the inscription on the pillar at Badál. I must however acknowledge, that this last-mentioned inscription does not indicate any attachment to the sect of Buddha. This may be accounted for, by supposing that the worshippers of Kṛishṇa and of Ráma, or whatever other sects prevailed, were then as cordial to the followers of Buddha, as they now are towards each other. The king and his minister might belong to different sects.

Amara is mentioned in an inscription at Buddha Gayá as the founder of a temple at that place. (As. Res. vol. i. p. 284.) This circumstance may serve to explain why his works have been proscribed with peculiar inveteracy, as it is acknowledged by many Paṇḍits that they have been. He was probably a zealous sectarist.

This is, however, by no means certain: and Bhánují Díkshita, in his commentary on the Amara Kosha, denies that there is any evidence to prove that the author belonged to the sect of Jainas. [For the supposed date of Amara Sinha, see Wilson's *Essays*, v. pp. 182–200; Gen. Cunningham's Report, B. A. S. J. vol. xxxii. pp. vii–x. The fifth or sixth century A.D. seems the most probable date.]

is a pretty full catalogue of indeclinables, which European philologists would call adverbs, prepositions, conjunctions, and interjections, but which Sanskrit grammarians consider as indeclinable nouns. The last chapter of the Amara Kosha is a treatise on the gender of nouns. Another vocabulary by the same author is often cited by his commentators, under the title of Amara Málá.

Numerous commentaries have been written on the Amara Kosha. The chief object of them is to explain the deriva-[18] tions of the nouns and to supply the principal deficiencies of the text. Sanskrit etymologists scarcely acknowledge a single primitive amongst the nouns. When unable to trace an etymology which may be consistent with the acceptation of the word, they are content to derive it, according to grammatical rules, from some root to which the word has no affinity in sense. At other times they adopt fanciful etymologies from Puráṇas or from Tantras: but, in general, the derivations are accurate and instructive. The best known among these commentaries of the Amara Kosha is the Pada Chandriká, compiled from sixteen older commentaries by Vṛihaspati, surnamed Mukuṭa, or at full length Ráya Mukuṭa Maṇi.[1] It appears from the incidental mention of the years then expired of astronomical eras, that Mukuṭa made this compilation in the 4532nd year of the Kali Yug, which corresponds with A.D. 1430. Achyuta Jallakí has abridged Mukuṭa's commentary, but without acknowledgment; and has given the title of Vyákhyá Pradípa to his compendium. On the other hand, Bhánují Díkshita has revised the same compilation, and has corrected the numerous errors of Mukuṭa, who often derives words from roots that are unknown to the language, or according to rules which have no place in its grammar. Bhánují has greatly improved the plan of the work, by inserting from other authorities the various acceptations of words exhibited by Amara in one or two senses only. This excellent compilation is entitled Vyákhyá Sudhá.[2]

[1] [Cf. Wilson, *Essays on Sansk. Lit.* iii. 204.] [2] [Cf. Wilson, *ibid*, pp. 204, 205.]

The Amara Kosha, as has been already hinted, gives a very incomplete list of words that have various acceptations. This defect is well supplied by the Mediní, a dictionary so named from its author, Mediníkar.[1] It contains words that bear many senses, arranged in alphabetical order by the final consonants; and a list of homonymous indeclinables is subjoined to it. A similar dictionary, compiled by [19] Maheśwara and entitled Viśwa Prakáśa, is much consulted, though it be very defective, as has been justly remarked by Mediníkar.[2] It contains, however, a very useful appendix on words spelt more than one way; and another on letters which are liable to be confounded, such as *v* and *b;* and another, again, on the gender of nouns. These subjects are not separately treated by Mediníkar; but he has, on the other hand, specified the genders with great care in the body of the work. The exact age of the Mediní is not certainly known; but it is older than Mukuṭa's compilation, since it is quoted by this author.

Amara's dictionary does not contain more than ten thousand different words; yet the Sanskrit language is very copious. The insertion of derivatives, that do not at all deviate from their regular and obvious import, has been very properly deemed superfluous. Compound epithets, and other compound terms, in which the Sanskrit language is peculiarly rich, are likewise omitted; excepting such as are especially appropriated, by a limited acceptation, either as titles of deities, or as names of plants, animals, etc. In fact, compound terms are formed at pleasure, according to the rules of grammar; and must generally be interpreted in strict conformity with those rules. Technical terms, too, are mostly excluded from general dictionaries, and consigned to separate nomenclatures. The Amara Kosha, then, is less defective than might be inferred from the small number of words explained in it. Still, however, it needs a supplement. The Hárávalí may be used

[1] [Cf. Wilson, *Essays on Sansk. Lit.* iii. pp. 217, 221.]
[2] [Cf. Wilson, *ib.* p. 215.]

as such. It is a vocabulary of uncommon words, compiled by Purushottama, the author of an etymological work, and also of a little collection of monograms, entitled Ekákshara.[1] His Háráválí was compiled by him under the patronage of Dhṛita Sinha. It is noticed by Mediníkar, and seems to be likewise anterior to the Viśwa.

[20] The remaining deficiencies of the Amara Kosha are supplied by consulting other dictionaries and vocabularies; such as Haláyudha's, Váchaspati's, the Dharaṇi Kosha, or some other. Sanskrit dictionaries are indeed very numerous. Purushottama and Mediníkar name the Utpaliní, Śabdárṇava, and Sansárávarta, as works consulted by them. Purushottama adds the names of Váchaspati, Vyáḍi, and Vikramáditya; but it is not quite clear whether he mentions them as the authors and patrons of these, or of other dictionaries. Mediníkar adds a fourth vocabulary, called Námamálá, and with similar obscurity subjoins the celebrated names of Bháguri, Vararuchi, S'áśwata, Bopálita, and Rantideva. He then proceeds to enumerate the dictionaries of Amara, Śubhánga, Haláyudha, Govardhana, Rabhasa Pála, and the Ratna Kosha; with the vocabularies of Rudra, Dhananjaya, and Gangádhara; as also the Dharaṇi Kosha, Háráválí, Vṛihad Amara, Trikáṇḍa Śesha, and Ratnamálá.[2] Many of these are cited by the commentators on Amara and by the scholiasts on different poems. The following are also frequently cited; some as etymologists, the rest as lexicographers: Swámí, Durga, Sarvadhara, Vámana, Chandra, and the authors of the Vaijayantí, Námanidhána, Haima, Vṛihat-nighaṇṭi, etc. To this list might be added the Anekártha Dhwani Manjari, Nánártha, and other vocabularies of homonymous terms; the Dwirukti, Bhúriprayoga Kosha, and other lists of words spelt in more than one way; and the various Nighaṇṭis or nomenclatures, such as the Dhanwantari Nighaṇṭa and Rája Nighaṇṭa, which con-

[1] [Cf. Wilson, *Essays on Sansk. Lit.* iii. pp. 211, 212.]
[2] [Cf. Wilson, *ib.* pp. 217–220.]

tain lists of the *materia medica;* and the Nighaṇṭi of the Veda, which explains obsolete words and unusual acceptations.[1]

[21] Before I proceed to mention other languages of India, it may be proper to mention, that the school of Benares now uses the Siddhánta Kaumudí, and other works of Bhaṭṭojí, as the same school formerly did the Kásiká Vṛitti. The Prakriyá Kaumudí, with its commentaries, maintains its ground among the learned of Mithilá or Tirhút. In both places, however, and indeed throughout India, the Mahábháshya continues to be the standard of Sanskrit grammar: it is therefore studied by all who are ambitious of acquiring a critical knowledge of the language. The Harikáriká, with its commentaries by Helárája and Punjarája, was probably in use with a school that once flourished at Ujjayiní, but it does not seem to be now generally studied in any part of India.

The second class of Indian languages comprehends the written dialects which are now used in the intercourse of civil life, and which are cultivated by lettered men. The author of a passage already quoted includes all such dialects under the general dènomination of Prákrit: but this term is commonly restricted to one language, namely, to the Saraswatí bála báṇí, or the speech of children on the banks of the Saraswatí.[2] There is reason to believe that ten polished dialects formerly prevailed in as many different civilized nations, who occupied all the fertile provinces of Hindustán and the Dakhin.[3] Evident traces of them still exist. They shall be

[1] The Nirukti, as explained in Sir William Jones's treatise on the literature of the Hindus, belongs to the same class with the Nighaṇṭi of the Veda: and a small vocabulary under both these titles is commonly annexed to the Ṛigveda to complete the set of Upavedas. There is, however, a much larger work entitled Nirukti; and the commentators of it are often cited upon topics of general grammar. See the preceding vol. p. [26]. [*Nighaṇṭi* and *Nirukti* are more corectly written *Nighaṇṭu* and *Nirukta.*]

[2] The term will bear a different interpretation, but this seems to be the most probable explanation of it. The other (youthful speech of Saraswatí) is generally received.

[3] [The exact relation of the modern vernacular languages of Northern India to Sanskrit and Prákrit is a still unsettled question (cf. Dr. Muir's *Sanskrit Texts,*

noticed in the order in which these Hindu nations are usually enumerated.

[22] The Sáraswata was a nation which occupied the banks of the river Saraswatí. Bráhmaṇas, who are still distinguished by the name of their nation, inhabit chiefly the Panjáb or Panchanada, west of the river from which they take their appellation. Their original language may have once prevailed through the southern and western parts of Hindustán proper, and is probably the idiom to which the name of Prákrit is generally appropriated. This has been more cultivated than any other among the dialects which will be here enumerated, and it occupies a principal place in the dialogue of most dramas. Many beautiful poems composed wholly in this language, or intermixed with stanzas of pure Sanskrit, have perpetuated the memory of it, though perhaps it have long ceased to be a vernacular tongue. Grammars have been compiled for the purpose of teaching this language and its prosody, and several treatises of rhetoric have been written to illustrate its beauties. The Prákṛita Manoramá and Prákṛita Pingala are instances of the one, and the Saraswatí Kaṇṭhábharaṇa of Bhojadeva, may be named as an example of the other, although both Sanskrit and Prákrit idioms furnish the examples with which that author elucidates his precepts. For the character of the Prákrit language I must refer the reader to Sir William Jones's remarks, in his preface to the translation of the Fatal Ring.

vol. ii. 2nd ed. chap. i). Between these modern dialects and Sanskrit we can at any rate trace four intermediate stages, though we cannot determine their relative antiquity to each other. Thus we find in the Buddhist *vaipulya sútras* or 'developed sútras' of Nepal long passages in verse, called *gáthás*, which are written in a popularized Sanskrit, full of barbarous inflections and corruptions, but still retaining a very strong likeness to the original. Then we have the language of the rock inscriptions of the second and third centuries B.C.; and closely connected with this, the Páli or Mágadhí of the sacred books of the Buddhists in Ceylon and Burmah. Here we find a pure Prákrit type, not, as in the Gáthás, a barbarous form of Sanskrit; it has a regular grammar and a vast literature of its own. Lastly we have the Prákrit dialects of the grammarians and the dramas; but none of these agree with the language of the inscriptions or with the Páli; and indeed they are undoubtedly of a more recent character.]

The Kányakubjas possessed a great empire, the metropolis of which was the ancient city of Kányakubja or Kanoj. Theirs seems to be the language which forms the groundwork of modern Hindustání, and which is known by the appellation of Hindí or Hindaví. Two dialects of it may be easily distinguished, one more refined, the other less so. To this last the name of Hindí is sometimes restricted, while the other is often confounded with Prákrit. Numerous poems have been composed in both dialects,[1] not only [23] before the Hindustání was ingrafted on the Hindí by a large intermixture of Persian, but also in very modern times, by Muhammadan as well as Hindu poets. *Dohrás* or detached couplets, and *Kabits* or stanzas, in the Hindaví dialect, may be found among the works of Musalmán authors: it will be sufficient to instance those of Malik Muhammad Jaisí, Muhammad Afzal, and Amírkhán Anjám. Most poems in this dialect are, however, the exclusive production of Hindu poets.[2] On examining them, the affinity of Hindí with the Sanskrit language is peculiarly striking; and no person acquainted with both can hesitate in affirming that Hindí is chiefly borrowed from Sanskrit. Many words, of which the etymology shows them to be the purest Sanskrit, are received unaltered; many more undergo no change but that of making the final vowel silent; a still greater number exhibits no other difference than what arises from the uniform permutation of certain letters; the

[1] [For further information respecting the different Hindí poets, see M. Garcin de Tassy's *Histoire de la Littérature Hindouie et Hindoustanie*. The oldest is Chand, who wrote his great epic, the *Pṛithwírája-Charitra*, about 1200 A.D.]

[2] Among the most admired specimens of Hindí poetry, the seven hundred couplets of Bihárí Lál, and the amatory verses of Súndar and of Matirám, are conspicuous. But their dialect is not pure Hindaví, since they sometimes borrow from the Persian language. Súndar wrote his poems in the reign of Sháhjahán, and seems to have been patronized by that prince, whom he praises in his preface. Bihárí Lál flourished at the court of Ambher, towards the beginning of the sixteenth century of the Christian era. His poems were arranged in their present order for the use of the unfortunate prince A'zam Sháh, and the modern edition is therefore called A'zamsháhí. The old edition has been elegantly translated into Sanskrit verse by Hariprasáda Paṇḍita, under the patronage of Chet Sinh, when Rájá of Benares.

rest, too, with comparatively few exceptions, may be easily traced to a Sanskrit origin. That this is the root from which Hindí has sprung (not Hindí the dialect whence Sanskrit has been refined) may be proved by etymology, the analogy of which is lost in Hindí and preserved in Sanskrit. A few examples will render this evident.

[24] *Kriyá* signifies action, and *karma* act, both of which are regularly derived from the root *kṛi* 'to do.' They have been adopted into Hindustání, with many other regular derivatives of the same root (such, for example, as *karaṇa* [contracted into *karná*] the act of doing; *kartá* the agent; *káraṇ* cause, or the means of doing; *kárya* [*kárj*, *káj*,] the thing to be done, and the intent or purpose of the action). But I select these two instances, because both words are adopted into Hindustání in two several modes. Thus *kriá* signifies action, and *kiriä* expresses one metaphorical sense of the same Sanskrit word, viz. oath or ordeal. Again, *kiriäkaram* signifies funeral rites; but *kám* is the most usual form in which the Sanskrit *karma* is exhibited in the Hindustání; and it thus assumes the same form with *kám*, desire, a very different word taken from the Sanskrit derivative of the root *kam*, to seek. Here then the Hindustání confounds two very different words in one instance, and makes two words out of one in the other instance.

Sat literally signifies existent: it is employed in the acceptation of truth. *Satya*, a regular derivative from it, signifies true; or, employed substantively, truth. The correspondent Hindí word, *sach*, is corrupted from the Sanskrit *satya*, by neglecting the final vowel, by substituting *j* for *y*, according to the genius of the Hindaví dialect, and by transforming the harsh combination *tj* into the softer sound of *ch*. Here then is obviously traced the identity of the Hindustání *sach*, and Bengálí *shotyo*, which are only the same Sanskrit word *satya* variously pronounced.

Yuvan signifies young, and *yauvana* youth. The first

makes *yuvá* in the nominative case: this is adopted into Hindustání with the usual permutation of consonants, and becomes *jubá*, as *yauvana* is transformed into *joban*. The same word has been less corrupted in Persian and Latin, where it stands *juwán* and *juvenis*. In many inflections [25] the root of *yuvan* is contracted into *yún*: the possessive case, for example, forms in the three numbers, *yúnas*, *yúnos*, *yúnám*. Here, then, we trace the origin of the Latin comparative *junior*; and I cannot hesitate in referring to these Sanskrit roots, the Welsh *jevangk*, and Armorican *jovank*, as well as the Saxon *yeong*, and finally the English *young*. This analogy, which seems evident through the medium of the Sanskrit language, is wholly obscured in Hindustání.

These examples might be easily multiplied, but unprofitably, I fear; for, after proving that nine-tenths of the Hindí dialect may be traced back to the Sanskrit idiom, there yet remains the difficulty of accounting for the remaining tenth, which is perhaps the basis of the Hindí language. Sir William Jones thought it so; and he thence inferred, that the pure Hindí was primeval in Upper India, into which the Sanskrit was introduced by conquerors from other kingdoms in some very remote age.[1] This opinion I do not mean to controvert. I only contend, that where similar words are found in both languages, the Hindí has borrowed from Sanskrit, rather than the Sanskrit from Hindí. It may be remarked too, that in most countries the progress has been from languages rich in inflections, to dialects simple in their structure. In modern idioms, auxiliary verbs and appendant particles supply the place of numerous inflections of the root: it may, for this reason, be doubted, whether the present structure of the Hindí tongue be not a modern refinement. But the question, which has been here hinted rather than discussed, can be decided only by a careful examination of the oldest compositions that are now extant in the Hindí dialect. Until some person

[1] See Sir W. Jones's third anniversary discourse.

execute this task, a doubt must remain, [26] whether the groundwork of Hindí, and consequently of Hindustání, be wholly distinct from that of Sanskrit.

On the subject of the modern dialect of Upper India, I with pleasure refer to the works of a very ingenious member of this society, Mr. Gilchrist, whose labours have now made it easy to acquire the knowledge of an elegant language, which is used in every part of Hindustán and the Dakhin, which is the common vehicle of colloquial intercourse among all well-educated natives, and among the illiterate also, in many provinces of India, and which is almost everywhere intelligible to some among the inhabitants of every village. The dialects which will be next noticed are of more limited use.

Gaura,[1] or as it is commonly called Bengalah, or Bengálí, is the language spoken in the provinces of which the ancient city of Gaur was once the capital. It still prevails in all the provinces of Bengal, excepting perhaps some frontier districts, but is said to be spoken in its greatest purity in the eastern parts only; and, as there spoken, contains few words which are not evidently derived from Sanskrit. This dialect has not been neglected by learned men. Many Sanskrit poems have been translated, and some original poems have been composed in it:[2] learned Hindus in Bengal speak it almost exclusively; [27] verbal instruction in sciences is communicated through this medium, and even public disputations are conducted in this dialect. Instead of writing it in the Devanágarí, as the Prákrit and Hindaví are written,[3] the inhabitants of Bengal

[1] It is necessary to remark, that although Gaura [Gauḍa] be the name of Bengal, yet the Bráhmaṇas, who bear that appellation, are not inhabitants of Bengal, but of Hindustán proper. They reside chiefly in the Subá of Delhí, while the Bráhmaṇas of Bengal are avowed colonists from Kanoj. It is difficult to account for this contradiction. The Gaura Bráhmaṇas allege a tradition, that their ancestors migrated in the days of the Páṇḍavas, at the commencement of the present Kali Yuga. Though no plausible conjecture can be founded on this tradition, yet I am induced to retract a conjecture formerly hazarded by me, that the Gar of our maps was the original country of the Gaura priests.

[2] [On old Bengálí literature, see two articles in vols. xiii. and xvii. of the *Calcutta Review*. The province is properly called Bangadeśa or Bángalá (sometimes Bángálá), and the language Bángalá; Bángálí only means a native of Bengal.]

[3] Prákrit and Hindí books are commonly written in the Devanágarí; but a

have adopted a peculiar character, which is nothing else but Devanágarí, difformed for the sake of expeditious writing. Even the learned amongst them employ this character for the Sanskrit language, the pronunciation of which, too, they in like manner degrade to the Bengálí standard. The labours of Mr. Halhed and Mr. Forster have already rendered a knowledge of the Bengálí dialect accessible; and Mr. Forster's further exertions will still more facilitate the acquisition of a language which cannot but be deemed greatly useful, since it prevails throughout the richest and most valuable portion of the British possessions in India.

Maithila, or Tirhutíya, is the language used in Mithilá (that is, in the Sirkár of Tirhút), and in some adjoining districts, limited however by the rivers Kuśí (Kauśikí), and Gandhak (Gandhakí), and by the mountains of Nepál. It has great affinity with Bengálí; and the character in which it is written differs little from that which is employed throughout Bengal. In Tirhút, too, the learned write Sanskrit in the Tirhutíya character, and pronounce it after their own inelegant manner. As the dialect of Mithilá has no extensive use, and does not appear to have been at [28] any time cultivated by elegant poets, it is unnecessary to notice it further in this place.

Utkala, or Oḍradeśa, is co-extensive with the Subá of Orissa, extending from Medinípúr to Mánakapattana, and from the sea to Sammall-púr. The language of this province, and the character in which it is written, are both called Uríya. So far as a judgment can be formed from imperfect specimens of this language, it contains many Sanskrit words variously corrupted, with some Persian and Arabic terms borrowed through the medium of Hindustání, and with others of

corrupt writing, called Nágarí, is used by Hindus in all common transactions where Hindí is employed by them; and a still more corrupted one, wherein vowels are for the most part omitted, is employed by bankers and others in mercantile transactions. I must here confess that I can give no satisfactory explanation of the term. The common etymology of *Nágarí* is unsatisfactory; unless Nagara be taken as the name of some particular place emphatically called the city.

doubtful origin. The letters are evidently taken from the Devanágarí; and the Bráhmans of this province use the Uríya character in writing the Sanskrit language. Its deviations from the Devanágarí may be explained, from the practice of writing on palm leaves with an iron style, or on paper with a pen cut from a porcupine's quill. It differs in this respect from the hand-writing of northern tribes, and is analogous to that of the southern inhabitants of the peninsula.

The five Hindu nations, whose peculiar dialects have been thus briefly noticed, occupy the northern and eastern portions of India; they are denominated the five Gaurs. The rest, called the five Drávirs, inhabit the southern and western parts of the peninsula. Some Paṇḍits, indeed, exclude Karṇáṭa, and substitute Káśmíra; but others, with more propriety, omit the Káshmirian tribe; and, by adding the Kánaras to the list of Drávirs, avoid the inconsistency of placing a northern tribe among southern nations. There is reason, too, for doubting whether Káśmíra be occupied by a distinct nation, and whether the inhabitants of it be not rather a tribe of Kányakubjas.

Drávira[1] is the country which terminates the peninsula of India: its northern limits appear to lie between the twelfth and thirteenth degrees of north latitude. The lan[29]guage of the province is the Támel, to which Europeans have given the name of Malabar,[2] from Malay-wár, a province of Drávira.

[1] [Mahráṭṭí and Gujaráṭí belong to the Sanskrit class of languages. Dr. Caldwell, in his *Dráviḍian Comparative Grammar*, p. 27, would make nine northern languages, *i.e.* Bengálí, Uríya, Hindí with its daughter Hindustání, Panjábí, Sindhí, Gujaráṭí, Mahráṭṭí, and the languages of Nepál and Káshmír. The Dráviḍian branch consists of Tamil, Telugu, Kanarese, and Malayálam, the language of Malabar (which is closely connected with Tamil). They all borrow largely from Sanskrit in their vocabulary, but they are essentially non-Sanskrit in their grammatical structure and their most important roots, and belong to the Turanian, not the Indo-European family. The dialects of most of the various mountain-tribes in Central and South India, as the Gonds, Khonds, etc., belong to the same stock, and perhaps some of those in North India; and hence it has been supposed that these languages represent the language of the aboriginal inhabitants of India previous to the immigration of the Sanskrit-speaking Áryan tribes. See Dr. Caldwell's *Dráviḍian Comp. Grammar*.]

[2] A learned Bráhman of Drávira positively assures me, that the dialect of Malabar, though confounded by Europeans with the Támel, is different from it, and is not the language to which Europeans have allotted that appellation.

They have similarly corrupted the true name of the dialect into Tamul, Tamulic, and Tamulian,[1] but the word, as pronounced by the natives, is Támla, or Támalah; and this seems to indicate a derivation from Támra, or Támraparṇí, a river of note which waters the southern Máthura, situated within the limits of Drávira. The provincial dialect is written in a character which is greatly corrupted from the parent Devanágarí, but which nevertheless is used by the Bráhmans of Drávira in writing the Sanskrit language. After carefully inspecting a grammar published by Mr. Drummond at Bombay, and a dictionary by missionaries at Madras, I can venture to pronounce that the Támla contains many Sanskrit words, either unaltered or little changed, with others more corrupted, and a still greater number of doubtful origin.

The Maháráshṭra, or Mahráṭṭa, is the language of a nation which has in the present century greatly enlarged its ancient limits. If any inference may be drawn from the name of the character in which the language is written, the country occupied by this people was formerly called Múru;[2] for the peculiar corruption of the Devanágarí, [30] which is employed by the Maháráshṭras in common transactions, is denominated by them Múr. Their books, it must be remarked, are commonly written in Devanágarí. The Mahráṭṭa nation was formerly confined to a mountainous tract situated south of the river Narmadá, and extending to the province of Kokán. Their language is now more widely spread, but is not yet become the vernacular dialect of provinces situated far beyond the ancient bounds of their country. Like other Indian tongues, it contains much pure Sanskrit, and more corruptions of that language, intermixed with words borrowed from Persian

[1] The Romish and Protestant missionaries who have published dictionaries and grammars of this dialect, refer to another language, which they denominate *Grandam* and *Grandonicum*. It appears that Sanskrit is meant, and the term thus corrupted by them is *Grantha*, a volume or book. [The Grantha character is used in Southern India for Sanskrit MSS.]

[2] Mentioned in the royal grant preserved at a famous temple in Karṇáṭa. See As. Res. vol. iii. p. 48. However, the Mahráṭṭas themselves affirm, that the Múru character was introduced amongst them from the island of Silán.

and Arabic, and with others derived from an unknown source. If the bards of Múru were once famous, their supposed successors, though less celebrated, are not less diligent. The Mahráṭṭas possess many poems in their own dialect, either translated from the Sanskrit, or original compositions in honour of Kṛishṇa, Ráma, and other deified heroes. Treatises in prose, too, on subjects of logic and of philosophy, have been composed in the Mahráṭṭa dialect.

Karṇáṭa, or Kánara, is the ancient language of Karṇáṭaka, a province which has given name to districts on both coasts of the peninsula. This dialect still prevails in the intermediate mountainous tract, but seems to be superseded by other provincial tongues on the eastern coast. A peculiar character formed from the Devanágarí, but, like the Támla, much corrupted from it through the practice of writing on palm leaves with an iron style, is called by the same name with the language of Karṇáṭak. Bráhmans of this tribe have assured me that the language bears the same affinity to Sanskrit as other dialects of the Dakhin. I can affirm, too, from their conversation, that the Kánaras, like most other southern tribes, have not followed the ill example of Bengal and the provinces adjacent to it, in pro[31]nouncing the Sanskrit language in the same inelegant manner with their own provincial dialects.

Tailanga, Telingah, or Tilanga, is at once the name of a nation, of its language, and of the character in which that language is written. Though the province of Telingána alone retain the name in published maps of India, yet the adjacent provinces on either bank of the Kṛishṇá and Godávarí, and those situated on the north-eastern coast of the peninsula, are undoubtedly comprehended within the ancient limits of Tilanga, and are inhabited chiefly by people of this tribe. The language, too, is widely spread: and many circumstances indicate that the Tailangas formerly occupied a very extensive tract, in which they still constitute the principal part of the

population. The character in which they write their own language is taken from Devanágarí, and the Tailanga Bráhmans employ it in writing the Sanskrit tongue, from which the Tailanga idiom is said to have borrowed more largely than other dialects used in the south of India. This language appears to have been cultivated by poets, if not by prose writers; for the Tailangas possess many compositions in their own provincial dialect, some of which are said to record the ancient history of the country.

The province of Gúrjara[1] does not appear to have been at any time much more extensive than the modern Guzrát, although Bráhmaṇas, distinguished by the name of that country, be now spread over the adjoining provinces on both sides of the Narmadá. This tribe uses a language denominated from their own appellation, but very nearly allied to the Hindí tongue, while the character in which it [32] is written conforms almost exactly with vulgar Nágarí. Considering the situation of their country, and the analogy of language and writing, I cannot hesitate in thinking that the Gúrjaras should be considered as the fifth northern nation of India, and the Uríyas should be ranked among the tribes of the Dakhin.

Brief and imperfect as is this account of the Prákrits of India, I must be still more concise in speaking of the languages denominated Mágadhí and Apabhranśa in the passages quoted at the beginning of this essay. Under these names are comprehended all those dialects which, together with the Prákrits above-noticed, are generally known by the common appellation of Bháshá, or speech. This term, as employed by all philologists, from Páṇini down to the present professors of grammar, does indeed signify the popular dialect of Sanskrit, in contradistinction to the obsolete dialect of the Veda;

[1] The limits of Gúrjara, as here indicated, are too narrow. It seems to have been co-extensive with the ancient, rather than the modern Guzrát, and to have included the whole, or the greatest part of Khándesh and Málwa.

but in common acceptation, Bhákhá (for so the word is pronounced on the banks of the Ganges) denotes any of the modern vernacular dialects of India, especially such as are corrupted from the Sanskrit: these are very numerous. After excluding mountaineers, who are probably aborigines of India, and whose languages have certainly no affinity with Sanskrit, there yet remain in the mountains and islands contiguous to India many tribes that seem to be degenerate Hindus. They have certainly retained some traces of the language and writing which their ancestors had been taught to employ.

Without passing the limits of Hindustán, it would be easy to collect a copious list of different dialects in the various provinces which are inhabited by the ten principal Hindu nations. The extensive region which is nearly defined by the banks of the Saraswatí and Gangá on the north, and which is strictly limited by the shores of the [33] eastern and western seas towards the south, contains fifty-seven provinces according to some lists, and eighty-four according to others. Each of these provinces has its peculiar dialect, which appears, however, in most instances, to be a variety only of some one among the ten principal idioms. Thus Hindustání, which seems to be the lineal descendant of the Kányakubja, comprises numerous dialects, from the Urdú Zabán, or language of the royal camp and court, to the barbarous jargon which reciprocal mistakes have introduced among European gentlemen and their native servants. The same tongue, under its more appropriate denomination of Hindí, comprehends many dialects strictly local and provincial. They differ in the proportion of Arabic, Persian, and Sanskrit, either pure or slightly corrupted, which they contain; and some shades of difference may be also found in the pronunciation, and even in the basis of each dialect.

Not being sufficiently conversant with all these idioms, I shall only mention two, which are well known, because lyric poets have employed them in songs that are still the delight

of natives of all ranks. I allude to the Panjábí and to the Brij-bhákhá. The first is the language of Panchanada, or Panjáb, a province watered by the five celebrated rivers which fall into the Sindhu. The songs entitled Kheáls and Tappas, which are no doubt familiar to all who have a taste for the vocal music of India, are composed almost exclusively in this dialect; as the Dhurpads and regular Rágs are Hindí; and Rekhtah,[1] in the language of the court of Hindustán.

The Brij-bhákhá, or Vraja Bháshá, is the dialect supposed to have been anciently spoken among the peasants [34] in the neighbourhood of Mathurá. It derives its name from the cow-pens (*vraja*) and dairies in the forest of Vṛindá, where Kṛishṇa was educated among the wives and daughters of the cowherds. His amorous adventures with Rádhá and the Gopís furnish the subject of many favourite songs in this dialect. It is still spoken with much purity throughout a great part of the Antarbed or Doáb, and in some districts on the opposite banks of the Yamuná and Gangá.

To these cursory observations might be fitly added a specimen of each language, and of the character in which it is written, together with a list of the most common terms in the various dialects of India, compared with words of similar sound and import in the ancient languages of Europe. I have, indeed, made collections for this purpose: but the insertion of a copious list would exceed the limits of a desultory essay. For this reason, and because the collection is yet incomplete, I suppress it: and shall here close the present essay abruptly, with the intention of resuming the subject, should the further prosecution of these inquiries at any future time enable me to furnish the information called for by this Society, concerning the number of Hindaví dialects, and the countries where they are spoken.

[1] The author of the Tazkirah Shua'rá Hind explains Rekhtah as signifying a poetry composed in the language of the royal court of Hindustán, but in the style and metre of Persian poetry.

II.

PREFACE TO THE AUTHOR'S "GRAMMAR OF THE SANSKRIT LANGUAGE."

[*Calcutta*, 1805. Folio.]

[35] HAVING accepted an honourable nomination to the post of Professor of the Sanskrit Language in the College of Fort William, early after the foundation of that useful institution, I felt it incumbent on me to furnish, through the press, the means of studying a language, which it was my duty to make known, but on which I had no intention of delivering oral instruction.

Among other undertakings adapted to this purpose, the publication of a Sanskrit Grammar was commenced, which was first intended to be brief and elementary, but of which the design has been enlarged in its progress. As the entire work will exceed the bounds of a single volume, a convenient break has been chosen to close the first, and a few remarks will be now prefixed to it, since a considerable time may elapse before the second volume be completed. I have the less scruple, in pausing upon this work, to devote my attention to other duties, because the deficient part of it may be supplied by the grammars which Mr. Forster and Mr. Carey will severally publish.

In the composition of this grammar, I have followed the system taught by writers, whose works are considered by the

prevailing sects of Hindus to be sacred, and to form an appendage of their scriptures. My reasons for preferring these to the popular or profane treatises on Grammar, were stated in an essay on the Sanskrit lan[36]guage inserted in the seventh volume of the *Asiatic Researches.*[1] I adhere to the opinion there expressed. The sacred grammar has been more cultivated, its agreement with ancient writings and classical authors has been more carefully verified, than any other grammar of the language: it is more usually cited, and more generally understood: and, as finally corrected by a long train of commentators, it is more accurate and complete.

The arrangement, indeed, is ill-adapted to facilitate study; both in the original work and in the numerous illustrations of it. But I thought it practicable to frame a grammar upon the same system, which should be easily intelligible to the English student of Sanskrit. Without believing that I have succeeded, I still think it to be practicable: and the difficulties which may be experienced in the following pages will in general be found owing merely to the want of examples; which have been omitted, under the apprehension of rendering the work too voluminous.

An improvement which has been recently effected in the types of the Nágarí character, by reducing their size, without diminishing their distinctness, has removed the objection to ample illustrations by examples: and, if this work should be reprinted, examples of every rule will accordingly be inserted; and, at all events, they will be retained in the second volume of this grammar.

On the same supposition of a new edition of this first volume, I should be desirous of altering some of the terms adopted by me in place of technical words in Sanskrit grammar. An unwillingness to coin new words in English led me to use some expressions, which are not sufficiently precise; others were selected by me, not anticipating objections to their use,

[1] See page [15] of the present volume.

which have since occurred: and, in some instances, I have inadvertently changed an appropriate term for one less suitable. The most material [37] intended changes are mentioned in the margin;[1] and the reader is requested to notice them.

I shall be likewise glad to have an opportunity of inserting the original rules of Sanskrit Grammar. They are usually committed to memory by native students of the language; and are cited by Sanskrit authors, in words, and not by reference to their place or their import. The knowledge of them is, therefore, material to the student of Sanskrit: and they are framed, like the aphorisms of other sciences among the Hindus, with studied and ingenious brevity.

The author of these grammatical aphorisms is Páṇini. His rules, with the annotations of Kátyáyana entitled Várttikas, confirmed or corrected by Patanjali in the Mahábháshya, constitute the standard of Sanskrit gram[38]mar. From the three saints, as Hindu grammarians affect to call them, there is no appeal. Other authorities may be admitted, where they are silent: but a deviation even by a classical or an ancient writer, from a rule in which they concur, is deemed either a poetical licence or a privileged barbarism.

[1] Letters, added by Sanskrit grammarians, as marks, but which are not sounded, nor retained in the inflections, are called by them *Anubandha* or *It;* which, in this grammar, has been translated *mute;* but the circumstance of such vowels being accented, leads to the inconsistency of speaking of accented mute vowels. They would be better designated by the word *indicatory.*

A class of derivative verbs, which in a former treatise I denominated *Frequentatives*, has been here named *Intensives.* On consideration, I revert to the first-mentioned term.

Under the head of tenses, I have used the word Aorist to signify *indefinite* in respect to a species of time, instead of indefinite as to time in general; the name of *Remote past* is not sufficiently descriptive of the import of the tense to which it has been assigned; and several others are open to similar remark: I wish therefore to change the names of the tenses, according to the following scheme:

1. Present.
2. Preterite unperceived (Remote past).
3. Crastine future (Absolute future).
4. Indefinite future (Aorist future).
5. Aorist 1st (Imperative, etc.).
6. Pridian past (Absolute past).
7. Aorist 2nd (Imperative, etc.).
8. Indefinite past (Aorist past).
9. Conditional (Conditional future).

The works of these sacred writers, with the notes of Kaiyyaṭa on the Mahábháshya, interpreted by his scholiasts, and more especially the perpetual commentary of Vámana on Páṇini's aphorisms, under the title of Káśiká Vṛitti, elucidated by the copious annotations of Haradatta Miśra in the Padamanjarí, are the basis of the grammar here printed. The Siddhánta Kaumudí, and Manoramá of Bhaṭṭojí, with their commentaries, have been frequently consulted by me. Much use has also been made of the Prakriyá Kaumudí, with its commentaries, the Prasáda and Tattwa Chandra: and I have continually referred to Maitreya, Mádhava, Vopadeva, and the other interpreters of Sanskrit roots. A reader, who may be desirous of verifying my authorities, should be apprized, that the Káśiká Vṛitti, Siddhánta Kaumudí, and Mádhavíya Vṛitti have been my chief guides: and that others, besides the books enumerated, have been occasionally consulted; as the Gaṇaratna Mahodadhi, the Vṛitti Sangraha, and the commentators of the Paribháshás; and sometimes, though rarely, the popular grammars.

For the information of the Sanskrit student, a list of these and other grammatical works will be subjoined, including many treatises which have not been used for this grammar; but none, which I do not know to be extant; and few, of which I do not actually possess complete copies. The list might have been greatly enlarged by adding the names of books quoted by undoubted authorities: and I shall only remark, in regard to such works, that the earliest [39] grammarians are expressly stated by Vopadeva to have been Indra, Chandra, Káśakṛitsna, Ápiśali, Śákaṭáyana, Páṇini, Amara, and Jainendra. Among these Páṇini remains; and some of the others: perhaps all.

The authorities, which have been mentioned by me, as generally followed in this grammar, differ materially in their arrangement. I have been guided sometimes by one, sometimes by another, as seemed best adapted to the two objects

proposed, conciseness and perspicuity. I am apprehensive, that, in the pursuit of both objects, one has frequently been missed. It was, however, with the view of compressing much grammatical information in a small compass, that paradigmas have been multiplied, but exhibited in a succinct form; and that general rules only are usually inserted in the text, while exceptions and special rules are placed in the notes.

I have admitted no remarks on general grammar, though suggested by the numerous peculiarities of Sanskrit. These, with the observations which occur on a comparison of the ancient language of India with those of Europe, are deferred until the completion of the work.

In the mean time, one singularity of the Sanskrit language may be noticed: its admitting both the ancient and the modern systems of grammatical structure. It abounds in inflections for cases and genders; tenses and persons: and it also admits a simple construction of indeclinable nouns with prepositions, and of participles with auxiliary verbs.

This remark anticipates on a part of the grammar reserved for the second volume, in which composition and syntax will be explained, with other matters indicated in the note subjoined to the table of contents of the first volume.

LIST OF SANSKRIT GRAMMARS, WITH COMMENTARIES, ETC.

[40] *Sútra* by Páṇini: rules of grammar in eight books entitled *Ashṭádhyáya;* comprising 3996 aphorisms.[1]

Várttika by Kátyáyana, amending or explaining Páṇini's rules.

Mahábháshya by Patanjali, interpreting or correcting Kátyáyana's annotations.

Mahábháshya Pradípa by Kaiyyaṭa, annotating Patanjali's gloss.

Bháshya Pradípodyota by Nágojí Bhaṭṭa, commenting on Kaiyyaṭa's notes.

Bháshya Pradípa Vivaraṇa by Íśwaránanda: another commentary on Kaiyyaṭa's notes.

Káśiká Vṛitti by Jayáditya or Vámana Jayáditya: a perpetual commentary on Páṇini's rules.

Padamanjarí by Haradatta Miśra: an exposition of the last-mentioned work.

Nyása or *Káśiká Vṛitti Panjiká* by Jinendra: another exposition of the same,[2] with explanatory notes by Rakshita.

Vṛitti Sangraha by Nágojí Bhaṭṭa: a concise commentary on Páṇini.

Bháshá Vṛitti by Purushottama Deva: a commentary on Páṇini's rules (omitting those which are peculiar to the dialect of the *Vedas*). [41]

Bháshá Vṛittyartha Vivṛitti by Sṛishṭidhara; explaining Purushottama's commentary.

S'abda Kaustubha by Bhaṭṭojí Díkshita, consisting of scholia on Páṇini (left incomplete by the author).

[1] [Edited in Calcutta with a Comm., A.D. 1809, and again by Böhtlingk, Bonn, 1839.]

[2] I state this with some distrust, not having yet seen the book. The Nyása is universally cited; and the Bodhinyása is frequently so. Vopadeva's Kávya Kámadhenu quotes the Nyása of Jinendra and that of Jinendra Buddhi. [Cf. Prof. Aufrecht's *Bodl. Cat.*, pp. 118*a*, 176*a*, 161*b*, 170*a*.]

Prabhá by Baidyanátha Páyagunda, also named Bálambhaṭṭa; a commentary on the *S'abda Kaustubha.*

Prakriyá Kaumudí by Rámachandra Ácharya: a grammar in which Páṇini's rules are used, but his arrangement changed.

Prasáda by Viṭṭhala Ácharya; a commentary on the *Prakriyá Kaumudí.*

Tattwa Chandra by Jayanta: another commentary on the same, abridged from one by Krishṇa Paṇḍita.

Siddhánta Kaumudí by Bhaṭṭojí Díkshita: a grammar on the plan of the *Prakriyá;* but more correct and complete.[1]

Manoramá or *Prauḍha Manoramá* by the same author; containing notes on his own work.[2]

Tattwa Bodhiní by Jnánendra Saraswatí: a commentary on Bhaṭṭojí's *Siddhánta Kaumudí.*[3]

S'abdendu S'ekhara by Nágeśa Bhaṭṭa (same with Nágojí Bhaṭṭa): another commentary on the *Siddhánta Kaumudí.*[4]

Laghu S'abdendu S'ekhara: an abridgment of the last.

Chidasthimálá by Baidyanátha Páyagunda: a commentary on the abridged gloss of Nágeśa.

S'abdaratna by Hari Díkshita: a commentary on Bhaṭṭojí's notes on the *Manoramá.*

Laghu S'abdaratna: an abridgment of the same.

Bháva Prakáśiká by Baidyanátha Páyagunda: an exposition of Hari Díkshita's commentary.

Madhya Kaumudí by Barada Rája: an abridgment of the *Siddhánta Kaumudí.* There is also a *Madhya Ma*[42]*noramá*; besides other abridgments of the *Siddhánta* itself, as the *Laghu Kaumudí,*[5] etc.

Paribháshá: maxims of interpretation from ancient grammarians, cited in the *Várttikas* and *Bháshya,* as rules for interpreting Páṇini's *Sútras.*

Paribháshá Vritti by Síra Deva: a commentary on the cited maxims of interpretation.

Laghu Paribháshá Vritti by Bháskara Bhaṭṭa: a succinct commentary on the same.

Paribháshártha Sangraha: another commentary on the same.

[1] [Edited in Calcutta, 1811, 1863, and 1870; in Bombay, 1866; and in Madras, 1858.]
[2] [Benares, 1868.]
[3] [Benares, 1863.]
[4] [Benares, 1865.]
[5] [Edited and translated by Ballantyne, 1849, 1867.]

Chandriká by Swayamprakáśánanda: interpreting the last-mentioned commentary.

Paribhâshendu S'ekhara by Nágeśa Bhaṭṭa: a brief exposition of the same maxims.[1]

Paribhâshendu S'ekhara Káśika by Baidyanátha Páyagunda, commenting the gloss of Nágeśa.

Káriká: metrical rules of grammar, cited in the *Mahábháshya*, *Káśiká Vṛitti*, etc.

Vákya Pradípa[2] by Bhartṛihari: metrical maxims chiefly on the philosophy of syntax. These are often cited under the name of *Harikáriká*.

Vaiyákaraṇa Bhúshaṇa by Koṇḍa Bhaṭṭa: on syntax and the philosophy of grammatical structure.[3]

Bhúshaṇa Sára Darpaṇa by Hariballabha: a commentary on the work last mentioned.

Vaiyákaraṇa Bhúshaṇa Sára: an abridgment of the same work.

Laghu Bhúshaṇa Kánti by Baidyanátha Páyagunda: a commentary on that abridgment.

Vaiyákaraṇa Siddhánta Manjúshá by Nágeśa Bhaṭṭa: on syntax and the philosophy of grammatical structure.

Laghu Vaiyákaraṇa Siddhánta Manjúshá: an abridgment of the same. [43]

Kalá by Baidyanátha Páyagunda: a commentary on the last-mentioned abridgment.

Other treatises on construction logically considered, which are very numerous, are omitted as belonging more properly to the science of logic.

Gaṇapáṭha: lists of words comprehended in rules of grammar, under general classes.

Gaṇaratna Mahodadhi: a collection of such lists, with a commentary.

Dhátupáṭha by Páṇini: the roots or themes systematically arranged, with their indicatory letters and their interpretations.

Dhátupradípa or *Tantrapradípa* by Maitreya Rakshita: an illustration of the list of roots, with examples of their inflections.

[1] [Benares, 1864; also edited and translated by Kielhorn, Bombay, 1870.]

[2] [Or rather *Vákyapadíya*.]

[3] [Printed with Hariballabha's Comm. at Benares, 1866. The *Bhúshaṇa Sára* was printed at Calcutta, 1849.]

Mádhavíya Vṛitti by Sáyaṇa Áchárya, in the name of Mádhava Áchárya: a copious exposition of the roots with their derivatives.[1]

The *Bhaṭṭi Kávya*, a poem describing the adventures of Ráma, may be considered as a grammatical work, having been purposely written for a practical instruction on grammar. It has several commentaries.[2]

The *S'ikshá*[3] of Páṇini and *Nirukta* of Yáska, with the commentaries on the *Nighaṇṭa* included in the last, are there omitted, as they are of little use, except in the reading of the *Vedas*. Treatises on particular branches of etymology are also omitted, as not very generally consulted. Such is the *Yan Luganta S'iromaṇi* on the formation of frequentative verbs.

Numerous other works, belonging to this grammar, have not been ascertained to be extant, being at present known only through quotations from them: as the *Páṇiníya Mata Darpaṇa* quoted in the *Prasáda;* and many others cited in the *Mádhavíya Vṛitti*. [44]

The following belong to other Systems of Grammar.

Sáraswatí Prakriyá by Anubhúti Swarúpáchárya: a grammar founded on seven hundred rules or aphorisms, pretended to have been received by the author from the goddess Saraswatí. This grammar is much used in Hindustán proper.[4]

A commentary on the same by Punjarája.

Another by Mahíbhaṭṭa.

Siddhánta Chandriká: another commentary on the same grammar.

Pada Chandriká: another, in which Páṇini's aphorisms are also exhibited.

Haimavyákaraṇa by Hemachandra or Hemasúri. A Sanskrit grammar is cited under this title, which is probably the same with Hemachandra's commentary on the *S'abdánuśásana*, entitled *Laghu Vṛitti;* comprised in eight books, including in the last the anomalies of the Prákrit language as derived from the Sanskrit. (The *Kámadhenu* cites a *S'abdánuśásana* by Abhinava

[1] [Westergaard's *Radices Linguæ Sanscritæ*, app.]

[2] [Calcutta, 1828, with two commentaries.]

[3] [On S'íkshá and S'ikshá, cf. Müller's *Anc. Sanskrit Lit.*, p. 113.]

[4] [This has been twice printed at Bombay, with a comm.]

Śákaṭáyana besides Hemasúri's work.) This grammar is used by the Jainas.

A commentary, without the author's name, is annexed to Hemachandra's grammar.

Prákṛita Manoramá: an abridged commentary on the *Prákṛita Chandriká* of Vararuchi; showing the anomalies of Prákrit formed from Sanskrit.[1]

Kátantra or *Kalápa:* a grammar, of which the rules or aphorisms are ascribed to the god Kumára. It is much used in Bengal.

Daurgasinhí: a commentary on the above by Durgasinha; but stated in the introductory couplet to be the work of Sarva Varman, who is accordingly cited in Vopadeva's *Kámadhenu.* [45]

Kátantra Vṛitti Ṭíká by Durgasinha: an exposition of the above-mentioned commentary. (The *Kámadhenu* quotes the *Durga Ṭíká* of Durgagupta, and the *Kátantra Vistára* of Vardhamána Miśra.)

Kátantra Panjiká by Trilochanadása: a commentary on the same grammar.

Kalápa Tattwárṇava by Raghunandana Áchárya S'iromaṇi: another commentary on the same grammar.

Kátantra Chandriká: another commentary on the same.

Chaitrakúṭi by Vararuchi: another on the same.

Vyákhyá Sára by Harirâma Chakravartí: another commentary.

Vyákhyá Sára by Rámadása: another, under the same title.

Other commentaries on the same grammar by Susheṇa Kavirája, Ramánátha, Umápati, Kulachandra, and Murári.

Kátantra Pariśishṭa by S'rípatidatta: a supplement to the *Kátantra.*

Pariśishṭa Prabodha by Gopínátha: a commentary on the above.

Pariśishṭa Siddhánta Ratnákara by S'ivaráma Chakravartí: another on the same.

Kátantra Gaṇa Dhátu: the roots or themes systematically arranged for the *Kátantra.*

Manoramá by Ramánátha: a commentary on that list of verbs.

Many other treatises belong to this grammar; as the *Kátantra Shaṭkáraka* by Rahasanandí,[2] the *Kátantra Uṇádi Vṛitti* by S'ivadása, the *Kátantra Chatushṭaya Pradípa, Kátantra Dhátughoshá, Kátantra S'abda Málá,* etc.

[1] [London, 1864.]

[2] [Maheśanandí? Ind. Off. Libr. MS.]

Sankshiptasára by Kramadíśwara: a grammar, corrected by Júmaranandí and often cited under the title of *Jaumara*. This grammar is in use in Bengal. [46]

A commentary on the above, by Goyíchandra.

Vyákára Dípiká by Nyáya Panchánana: an exposition of Goyíchandra's commentary.

Another exposition of the same commentary by Vansívadana.

Durghaṭa Ghaṭana: another commentary on the *Sankshiptasára*.

Other commentaries on the same grammar, by different authors, as Gopála Chakravartí, etc.

A supplement to Júmaranandí's corrections of the *Sankshiptasára* by Goyíchandra.

Other treatises appertain to this grammar, as *S'abdaghoshá*, *Dhátughoshá*, etc.

Mugdhabodha by Vopadeva: a grammar of the Sanskrit language, much studied in Bengal.[1]

A commentary by the author of the grammar.

Another by Durgádása, entitled *Subodhiní*.

One by Miśra, entitled *Chháṭá*.

Other commentaries by Rámánanda, Ráma Tarkavágíśa, Madhusúdana, Devídása, Rámabhadra, Rámaprasáda Tarkavágíśa, Sríballabháchárya, Dayaráma Váchaspati, Bholánátha, Kártika Siddhánta, Ratikánta Tarkavágíśa, Govinda Ráma, etc.

Mugdhabodha Pariśishṭa by Káśíśwara: a supplement to the *Mugdhabodha*.

Another by Nandakiśora.

Kavikalpadruma by Vopadeva: an alphabetical catalogue of roots, arranged in verse.

Kávya Kámadhenu by the same author, explaining his own list of verbs.

Dhátu Dípiká by Durgádása: a commentary on the same catalogue of verbs. [47]

Kavikalpadruma Vyákhyá by Ráma Nyáyálankára: another commentary on the same.

Dháturatnávali by Rádhákṛishṇa: a metrical catalogue of roots.

[1] [Often printed in Calcutta; with Durgádása's Comm., 1863.]

Kavirahasya by Halâyudha: exhibiting in verse examples of the most common verbs.

A commentary on the same.

Supadma by Padmanâbha Datta: a grammar of Sanskrit. It is in use in some parts of Bengal.

Supadma Makaranda, or *Makaranda:* a commentary on the above, by Vishṇu Miśra.

Other commentaries by various authors: as Kandarpa Siddhânta, Kâśîśwara, S'rídhara Chakravartí, Râmachandra, etc.

Supadma Pariśishṭa: a supplement to the grammar.

Supadma Dhâtupâṭha by Padmanâbha Datta: a list of themes or roots for the author's grammar, called *Supadma*. The same author added other appendages to his grammar, viz., *Paribhâshâ* and *Uṇâdivṛitti*.

Other treatises belong to this grammar; as the *Kâśiśwarî Gaṇa*, and its commentary by Râmakânta.

Ratnamâlâ by Purushottama: a grammar used in *Kâmarûpa*.

Druta Bodha by Bharatamalla: a grammar, with a commentary on it by the same author. This and the following are not much in use.

S'udhâśubodha[1] by Râmeśwara: another grammar with a commentary by the author himself.

Harinâmâmṛita by Jívaghosha Swâmí: another, with a commentary. [48]

Chaitanyâmṛita: another, also accompanied by a commentary.

Kârikâvalî by Râma Nârâyaṇa: a grammar in verse.

Prabodha Prakâśa by Balarâma Panchânana: a grammar.

Rûpamâla by Vimala Saraswatí: another grammar.

Jnânâmṛita by Kâśîśwara: another.

Âśubodha, Laghubodha, S'ighrabodha, Sârâmṛita, Divya, Padâvalî, Ulkâ; and many other grammars by various authors.

Besides Vararuchi's *Prâkṛita Prakâśa* or *Chandrikâ*, and Bhâmaha's commentary entitled *Manoramâ Vṛitti* before mentioned, other grammars of Prâkrit are known: as the *Prâkṛita Kâmadhenu, Prâkṛita Lankeśwara*, etc.

[1] [S'uddhâ-, India Office Libr. MS.]

Authorities of Sanskrit grammar, cited in books which have been used for the present volume, but not otherwise known, nor in any manner ascertained to be now extant, have been excluded from the foregoing list. Many of them could not be confidently referred to any particular system of grammar; and, in numerous instances, a doubt arises, whether the same work be not quoted under different names, in different places: sometimes, under the title of the book; at other times, under the designation of the author. A few of these names, which occur most frequently, will be here enumerated, with a notice of the authority by which they are quoted.

Páṇini himself names Śákalya, Gárgya, Káśyapa, Gálava, Ápiśali, Śákaṭáyana, Bháradwája, Áśwaláyana,[1] Sphoṭáyana, and Chákravarmaṇa.

The *Mádhavíya Vṛitti* quotes, among many other authors, Chandra, Ápiśali, Śákaṭáyana, Átreya, Dhanapála, Kauśika, Purushakára, Sudhákara, [49] Madhusúdana, Yádava, Bháguri, Śríbhadra, Śivadeva, Rámadeva Miśra, Deva, Nandí, Ráma, Bhíma, Bhoja, Helárája, Subhúti Chandra, Púrṇa Chandra, Yajnanáráyaṇa, Kaṇwa, Swámí, Keśava Swámí, Śiva Swámí, Dhúrta Swámí, Kshíra Swámí (this last is cited in the *Prasáda* as author of the *Kshíra Taranginí*). The *Mádhavíya* likewise frequently cites the *Taranginí, Ábharaṇa, Śábdikábharaṇa, Samantá, Prakriyá Ratna* and *Pratípa.*

The *Várttikas* of Vyághra Bhúti and Vyághra Páda are mentioned by many authors; and so is the *Dhátu Páráyaṇa.* Vopadeva, in the *Kámadhenu,* has quoted the *Panjiká Pradípa* of Kuśala (belonging perhaps to the grammar called *Kátantra;*) and the *Saraswatí Kaṇṭhábharaṇa* (ascribed by some to Bhoja Deva). The *Prasáda* often cites the *Rámavyákaraṇa,* and seems to name Vopadeva as the author of it.

The following are, among others, noticed in the *Dhátu Dípiká* of Durgádása, viz. Bhaṭṭamalla, Govinda Bhaṭṭa, Chaturbhuja, Gadisinha, Govardhana, and Saraṇadeva.

[1] [Senaka? cf. *Sút.* v. 4, 112.]

III.

PREFACE TO THE AUTHOR'S EDITION OF THE AMARA KOSHA.[1]

[*Calcutta*, 1808. 4to.]

[50] THE compilation of a Sanskrit dictionary having been undertaken early after the institution of the College of Fort William, it was at the same time thought advisable to print, in Sanskrit and English, the work which has been chosen for the basis of that compilation, as well for the sake of exhibiting an original authority to which reference will be frequently necessary, as with the view of furnishing an useful vocabulary, which might serve until an ampler dictionary could be prepared and published.

The celebrated Amara Kosha, or Vocabulary of Sanskrit by Amara Sinha, is, by the unanimous suffrage of the learned, the best guide to the acceptations of nouns in Sanskrit. The work of Páṇini on etymology is rivalled by other grammars, some of which have even obtained the preference in the opinion of the learned of particular provinces; but Amara's vocabulary has prevailed wherever the Sanskrit language is cultivated, and the numerous other vocabularies which remain, are consulted only where Amara's is either silent or defective. It has employed the industry of innumerable commentators, while none of the others (with the single exception of Hemachandra's) have been interpreted even by one annotator. Such decided preference for the Amara Kosha, and the consequent frequency of quotations from it, determined the selection of

[1] [Cf. Wilson's *Essays*, vol. v. pp. 158-252, "Preface to the Sans. Dict. 1819."]

this as the basis of an alphabetical dictionary, and sug-[51] gested the expediency of also publishing the original text with an English interpretation.

Like other vocabularies of Sanskrit, that of Amara is in metre; and a considerable degree of knowledge of the language becomes requisite to discriminate the words from their interpretations, and to separate them from contiguous terms which affect their initials and finals. On this account, and to adapt the work to the use of the English student, the words, of which the sense is exhibited, are disjoined from their interpretation (which is included between crotchets); and the close of each word is marked by a roman letter over it indicating the gender of the noun. Where a letter has been permuted according to the Sanskrit system of orthography, a dot is placed under the line, to intimate that a letter is there altered or omitted; and a marginal note is added, exhibiting the radical final of the noun, or its initial, in every instance where either of them is so far disguised by permutation as not to be easily recognized upon a slight knowledge of the rudiments of the language, and of its orthography. An explanation in English is given in the margin, and completed when necessary at the foot of the page. The different interpretations proposed by the several commentators, and the variations in orthography remarked by them, are also specified in the same place.

According to the original plan of the present publication, the variations in the reading of the text (for which a careful collation has been made of several copies and of numerous commentaries) are noticed only where they affect the interpretation of a word or its orthography. It was not at first intended to insert those differences which are remarked by commentators upon other authority, and not upon the ground of any variation in the text itself. However, the utility of indicating such differences was after[52]wards thought to counterbalance any inconvenience attending it; and after some progress had been made at the press, this and other

additions to the original design were admitted, which have rendered a supplement necessary to supply omissions in the first chapters, and complete the work upon an uniform plan.

To avoid too great an increase of the volume, the various readings and interpretations are rather hinted than fully set forth: it has been judged sufficient to state the result, as the notes would have been too much lengthened, if the ground of disagreement had been everywhere exhibited and explained. For the same reason, authorities have not been cited by name. The mention of the particular commentator in each instance would have enlarged the notes, with very little advantage, as the means of verifying authorities are as effectually furnished by an enumeration of the works which have been employed and consulted. They are as follows:

I.—*The text of the Amara Kosha.*

This vocabulary, comprised in three books, is frequently cited under the title of Trikáṇḍa,[1] sometimes under the denomination of Abhidhána (nouns), from its subject; often under that of Amara Kosha, from the name of the author. The commentators are indeed unanimous in ascribing it to Amara Sinha. He appears to have belonged to the sect of Buddha (though this be denied by some of his scholiasts), and is reputed to have lived in the reign of Vikramáditya; and he is expressly named among the [53] ornaments of the court of Rájá Bhoja,[2] one of the many princes to whom that title has been assigned. If this mention of him be accurate, he must have lived not more than eight hundred years ago; for a poem entitled Subháshita Ratna Sandoha, by a Jaina author named Amitagati, is dated in the year 1050 from the

[1] *i.e.* the Three Books. But that name properly appertains to a more ancient vocabulary, which is mentioned by the commentaries on the Amara Kosha, among the works from which this is supposed to have been compiled.

[2] In the Bhoja Prabandha. [On this romance cf. Wilson, *Essays*, vol. v. pp. 168-177. Prof. Aufrecht, Bodl. Cat., p. 151, places the author Ballála at the end of the sixteenth century.]

death of Vikramáditya, and in the reign of Munja, who was uncle and predecessor of Rájá Bhoja. It, however, appears inconsistent with the inscription at Buddha Gayá[1] which is dated in the year 1005 of the era of Vikramáditya, and in which mention is made of Amara Deva, probably the same with the author of the vocabulary. From the frequent instances of anachronism, both in sacred and profane story as current among the Hindus, more confidence seems due to the inscription than to any popular tales concerning Rájá Bhoja; and the Amara Kosha may be considered as at least nine hundred years old, and possibly more ancient.[2]

It is intimated in the author's own preface that the work was compiled from more ancient vocabularies:[3] his commentators instance the Trikáṇḍa,[4] Utpáliní, Rabhasa and Kátyáyana, as furnishing information on the nouns, and Vyáḍi and Vararuchi on the genders. The last mentioned of these authors is reputed contemporary with Vikramáditya, and consequently with Amara Sinha himself.

The copies of the orignal which have been employed in the correction of the text, in the present publication, are,

1st. A transcript made for my use from an ancient corrected copy in the Tirhutíya character, and collated by me with a copy in Devanágarí, which had been carefully examined by Sir William Jones. He had inserted in it [54] an English interpretation, of which also I reserved a copy, and have derived great assistance from it in the present publication.

2nd. A transcript in Devanágarí character, with a commentary and notes in the Kánara dialect. It contains numerous passages, which are unnoticed in the most approved commentaries, and which are accordingly omitted in the present edition.

3rd. Another copy in the Devanágarí character, with a brief and imperfect interpretation in Hindí.

1 [As. Researches, i. 284.] 2 [Cf. p. [17], *suprà*.]

3 [For S'ás'wata's *Nánárthakosha* cf. Aufrecht's *Bodl. Cat.* p. 182.]

4 See a preceding note.

4th. A copy in the Bengal character, with marginal notes explanatory of the text.

5th. A copy in duplicate, accompanied by a Sanskrit commentary, which will be forthwith mentioned (that of Rámáśrama). It contains a few passages not noticed by most of the commentators. They have been, however, retained on the authority of this scholiast. A like remark is applicable to certain other passages expounded in some commentaries, but not in others. All such have been retained, where the authority itself has been deemed good.

6th. Recourse has been occasionally had to other copies of the text in the possession of natives, whenever it has been thought any ways requisite.

II.—*Commentaries on the Amara Kosha.*

1. At the head of the commentaries which have been used, must be placed that of Ráya Mukuṭa (or Vṛihaspati, surnamed Ráya Mukuṭa Maṇi). This work, entitled Padachandriká, was compiled, as the author himself informs us, from sixteen earlier commentaries, to many of which he repeatedly refers; especially those of Kshíra Swámí, Subhúti, Haḍḍa Chandra, Kalinga, Kon[55]kaṭa, Sarvadhara, and the Vyákhyámṛita, Ṭíkásarvaswa, etc.[1]

Its age is ascertained from the incidental mention of a date, viz. 1353 Śáka, or 4532 of the Kali Yuga, corresponding to A.D. 1431.

Though the derivations in Mukuṭa's commentary be often inaccurate, and other errors also have been remarked by later compilers, its authority is in general great; and accordingly it has been carefully consulted under every article of the present work.

2. Among the earlier commentaries named by Ráya Mu-

[1] The following names may be selected from Mukuṭa's quotations, to complete the number of sixteen: *Mádhaví, Madhu Mádhaví, Sarvánanda, Abhinanda,* Rájadeva, Govardhana, Dráviḍa, Bhojarája. But some of these appear to be separate works, rather than commentaries on the Amara Kosha. Mukuṭa occasionally cites the most celebrated grammarians, as Páṇini, Jayáditya, Jinendra, Maitreya, Rakshita, Purushottama, Mádhava, etc.

kuṭa, that of Kshíra Swámí is the only one, which has been examined in the progress of this compilation. It is a work of considerable merit; and is still in general use in some provinces of India, although the interpretations not unfrequently differ from those commonly received.

3. The Vyákhyásudhá, a modern commentary by Rámáśrama or by Bhánudíkshita (for copies differ as to the name of the author), is the work of a grammarian of the school of Benares.[1] He continually refers to Ráya Mukuṭa and to Swámí; and his work serves to confirm their scholia where accurate, and to correct them where erroneous. It has been consulted at every line.

4. The Vyákhyá Pradípa, by Achyuta Upádhyáya, is a concise and accurate exposition of the text; but adds little to the information furnished by the works above mentioned. It has been, however, occasionally consulted.

In these four commentaries, the derivations are given [56] according to Páṇini's system. In others, which are next to be enumerated, various popular grammars are followed for the etymologies. But, as the derivations of the words are not included in the plan of the present work, being reserved for a place in the intended alphabetical dictionary of Sanskrit, those commentaries have not been the less useful in regard to the information which was sought in them.

5. The commentary of Bharata Malla (entitled Mugdhabodhiní) has been as regularly consulted as those of Mukuṭa and Rámáśrama. It is, indeed, a very excellent work; copious and clear, and particularly full upon the variations of orthography according to different readings or different authorities: the etymologies are given conformably with Vopadeva's system of grammar. The author flourished in the middle of last century.

6. The Sára Sundarí, by Mathureśa, has been much used. It is perspicuous and abounds in quotations from other com-

[1] [Cf. Prof. Aufrecht, *Bodl. Cat.* p. 182, *a*.]

mentaries, and is therefore a copious source of information on the various interpretations and readings of the text. The Supadma is the grammar followed in the derivations stated by this commentator. Mathureśa is author likewise of a vocabulary in verse, entitled Śabdaratnávalí, arranged in the same order with the Amara Kosha, and which might serve therefore as a commentary on that work. It was compiled under the patronage of a Musalmán chieftain, Murchhá Khán, whose name is prefixed to it. The author wrote not more than 150 years ago.[1]

7. The Padártha Kaumudí, by Náráyaṇa Chakravartí, is another commentary of considerable merit, which has been frequently consulted. The Kalápa is the grammar followed in the etymologies here exhibited.

[57] 8. A commentary by Ramánátha Vidyá Váchaspati, entitled Trikáṇḍa Viveka, is peculiarly copious on the variations of orthography, and is otherwise a work affording much useful information.

9. Another commentary, which has been constantly employed, is that by Nílakaṇṭha. It is full and satisfactory on most points for which reference is usually made to the expositors of the Amara Kosha.

10. The commentary of Rámatarka Vágíśa has been uniformly consulted throughout the work. It was recommended for its accuracy; but has furnished little information, being busied chiefly with etymology. This, like the preceding, follows the grammar entitled Kalápa.

Other commentaries were also collected for occasional reference in the progress of this work; but have not been employed, being found to contain no information which was not also furnished, and that more amply, by the scholiasts above mentioned.

The list of them contained in the subjoined note may therefore suffice.[2]

[1] His work contains the date 1588 S'áka, or 1666.

[2] Kaumudí by Nayanánanda; Trikáṇḍa Chintámaṇi by Raghunátha Chakra-

III.—*Sanskrit dictionaries and vocabularies by other authors.*

Throughout the numerous commentaries on the Amara Kosha, the text itself is corrected or confirmed, and the interpretations and remarks of the commentators supported, by reference to other Sanskrit vocabularies. They are often cited by the scholiasts for the emendation of the text in [58] regard to the gender of a noun, and not less frequently for a variation of orthography, or for a difference of interpretation. The authority quoted has been in general consulted, before any use has been made of the quotations; or, where the original work cannot now be procured, the agreement of commentators has been admitted as authenticating the passage. This has been particularly attended to in the chapter containing homonymous words, it having been judged useful to introduce into the notes of that chapter the numerous additional acceptations stated in other dictionaries, and understood to be alluded to in the Amara Kosha.

The dictionaries which have been consulted are, 1st. The Mediní,[1] an alphabetical dictionary of homonymous terms by Mediníkara.

2. The Viśwa Prakáśa by Maheśwara Vaidya, a similar dictionary, but less accurate and not so well arranged. It is the ground-work of the Mediní, which is an improved and corrected work of great authority. Both are very frequently cited by the commentators.

3. The Haima,[2] a dictionary by Hema Chandra, in two parts; one containing synonymous words arranged in six chapters;[3] the other containing homonymous terms in alphabetical order. Both are works of great excellence.

vartí; both according to Páṇini's system of etymology. Vaishamya Kaumudí by Rámaprasáda Tarkálankára; Pada Manjarí by Lokanátha; both following the grammatical system of the Kalápa. Pradípa Manjarí by Rámáśrama, a jejune interpretation of the text. Vṛihat Háravalí by Rámeśwara. Also commentaries by Kṛishṇadása, Trilochanadása, Sundaránanda, Vanadíyabhaṭṭa, Viśwanátha, Gopála Chakravartí, Govindánanda, Rámánanda, Bholánátha, etc.

[1] [Edited by Somanátha S'arman, Calcutta, 1868.]

[2] [Printed, Calcutta, 1808.] [3] [Edited by Böhtlingk and Rieu, 1847.]

4. The Abhidhána Ratnamálá,[1] a vocabulary by Haláyudha, in five chapters; the last of which relates to words having many acceptations. It is too concise for general use, but is sometimes quoted.

5. The Dharaṇí, a vocabulary of words bearing many senses. It is less copious than the Mediní and Haima; but being frequently cited by commentators, has been necessarily consulted.

6. The Trikáṇḍa Śesha, or supplement to the Amara Kosha, by Purushottama Deva.

[59] 7. The Háràvalí of the same author.

The last of these two supplements to Amara, being a collection of uncommon words, has not been much employed for the present publication. The other has been more used. Both are of considerable authority.

The reader will find in the notes a list of other dictionaries quoted by the commentators, but the quotations of which have not been verified by reference to the originals, as these have not been procurable.[2]

Works under the title of Varṇadeśaná, Dwirúpa, and Uṇádi, have indeed been procured; but not the same with the books cited, many different compilations being current under those titles. The first relates to words, the orthography of which is likely to be mistaken from a confusion of similar letters; the second exhibits words which are spelt in more than one way; the third relates to a certain class of derivatives separately noticed by grammarians.

IV.—*Grammatical works.*

Grammar is so intimately connected with the subject of this publication, that it has been of course necessary to advert to the works of grammarians. But as they are regularly

[1] [Edited by Prof. Aufrecht, 1861.]

[2] *Amara Málá*, Amara Datta, *S'abdárṇava*, S'ás'wata, *Varṇadeśaná*, *Dwirúpa*, *Uṇádi Kosha*, *Ratna Kosha*, *Ratna Málá*, Rantideva, Rudra, Vyáḍi, Rabhasa, Vopálita, Bháguri, Ajaya, Váchaspati, Tárapála, Aruṇadatta. [Cf. Wilson, *Essays*, v. pp. 209-237.]

cited by the commentators, it is needless to name them as authorities, since nothing will be found to have been taken from this source, which is not countenanced by some passage in the commentaries on the Amara Kosha.

V.—*Treatises on the roots of Sanskrit.*

Verbs not being exhibited in the Amara Kosha, which is a vocabulary of nouns only, the treatises of Maitreya, [60] Mádhava, and others, on the Sanskrit roots, though furnishing important materials towards a complete dictionary of the language, have been very little employed in the present work; and a particular reference to them was unnecessary, as authority will be found in the commentaries on Amara, for anything which may have been taken from those treatises.

VI.—*The Scholia of classic writings.*

Passages from the works of celebrated writers are cited by the commentators on the Amara Kosha, and the scholiasts of classic poems frequently quote dictionaries in support of their interpretation of difficult passages. In the compilation of a copious Sanskrit dictionary ample use may be made of the scholia. They have been employed for the present publication so far only as they are expressly cited by the principal commentaries on the Amara Kosha itself.

Should the reader be desirous of verifying the authorities upon which the interpretation and notes are grounded, he will in general find the information sought by him in some one of the ten commentaries of Amara, which have been before named, and will rarely have occasion to proceed beyond those which have been specified as the works regularly consulted.

In regard to plants and animals, and other objects of natural history, noticed in different chapters of this vocabulary, and especially in the 4th, 5th, and 9th chapters of the second book, it is proper to observe, that the ascertainment of them generally depends on the correctness of the corresponding vernacular names. The commentators seldom furnish any

description or other means of ascertainment besides the current denomination in a provincial language. A view of the animal, or an examination of the plant, known [61] to the vulgar under the denomination, enables a person conversant with natural history to determine its name according to the received nomenclature of European Botany and Zoology: but neither my inquiries, nor those of other gentlemen, who have liberally communicated the information collected by them,[1] nor the previous researches of Sir William Jones, have yet discovered all the plants and animals, of which the names are mentioned by the commentators on the Amara Kosha; and even in regard to those which have been seen by us, a source of error remains in the inaccuracy of the commentators themselves, as is proved by the circumstance of their frequent disagreement. It must be therefore understood, that the correspondence of the Sanskrit names with the generic and specific names in natural history is in many instances doubtful. When the uncertainty is great, it has usually been so expressed; but errors may exist where none have been apprehended.

It is necessary likewise to inform the reader, that many of the plants, and some animals (especially fish), have not been described in any work yet published. Of such, the names have been taken from the manuscripts of Dr. Roxburgh and Dr. F. Buchanan.

Having explained the plan and design of this edition of the Amara Kosha, I have only further to state, that the delay which has arisen since it was commenced (now more than five years) has been partly occasioned by my distance from the press (the work being printed by Mr. Carey at Serampoor), and partly by avocations which have retarded the progress of collating the different copies of the text and commentaries: a task, the labour of which may be judged by those who have been engaged in similar undertakings.

Calcutta, December, 1807.

[1] Drs. Roxburgh, F. Buchanan, and W. Hunter: and Mr. William Carey.

IV.

ON SANSKRIT AND PRÁKRIT POETRY.[1]

[*From the Asiatic Researches*, vol. x. pp. 389-474.
Calcutta, 1808. 4to.]

[62] The design of the present essay is not an enumeration of the poetical compositions current among the Hindus, nor an examination of their poetry by maxims of criticism recognized in Europe, or by rules of composition taught in their own treatises of rhetoric; but to exhibit the laws of versification, together with brief notices of the most celebrated poems in which these have been exemplified.

An inquiry into the prosody of the ancient and learned language of India will not be deemed an unnecessary introduction to the extracts from the Indian poems, which may be occasionally inserted in the supplementary volumes of Asiatic Researches; and our Transactions record more than one instance of the aid which was derived from a knowledge of Sanskrit prosody, in deciphering passages rendered obscure by the obsoleteness of the character, or by the inaccuracy of the transcripts.[2] It will be found similarly useful by every person who studies that language, since manuscripts are in general grossly incorrect; and a familiarity with the metre will frequently assist the reader in restoring the text where it has been corrupted. Even to those who are unacquainted with the language, a concise explanation of the Indian system of prosody may be curious, since the artifice of its construction

[1] [For a full account of Sanskrit metre see Prof. Weber's two treatises in the eighth volume of the *Indische Studien*. The first treats of the Vedic metres, the second gives the text of Pingala's Chhandaḥ-sútra with a perpetual commentary. Cf. also C. P. Brown's *Sanskrit Prosody*.]

[2] As. Res., vol. i. p. 279; vol. ii. p. 389.

is peculiar, and not [63] devoid of ingenuity; and the prosody of Sanskrit will be found to be richer than that of any other known language, in variations of metre, regulated either by quantity or by number of syllables, both with and without rhyme, and subject to laws imposing in some instances rigid restrictions, in others allowing ample latitude. I am prompted by these considerations to undertake the explanation of that system, premising a few remarks on the original works in which it is taught, and adding notices of the poems from which examples are selected.

The rules of prosody are contained in Sútras, or brief aphorisms, the reputed author of which is Pingalanága, a fabulous being, represented by mythologists in the shape of a serpent; and the same who, under the title of Patanjali, is the supposed author of the Mahábháshya, or great commentary on grammar, and also of the text of the Yoga Śástra;[1] and to whom likewise the text or the commentary of the Jyotisha annexed to the Vedas[2] appears to be attributed. The aphorisms of Pingaláchárya, as he is sometimes called, on the prosody of Sanskrit (exclusive of the rules in Prákrit likewise ascribed to him), are collected into eight books, the first of which allots names, or rather literal marks, to feet consisting of one, two, or three syllables. The second book teaches the manner in which passages of the Vedas are measured. The third explains the variations in the subdivision of the couplet and stanza. The fourth treats of profane poetry, and especially of verses, in which the number of syllables, or their quantity, is not uniform. The fifth, sixth, and se[64]venth, exhibit metres of that sort which has been called monoschematic, or uniform, because the same feet recur invariably in the same places. The eighth and last book serves as an appendix to the

[1] Or Sánkhya system of philosophy, distinguished from that of Kapila. (See vol. i. p. [235], etc.)

[2] In the subscription to the only copy of this commentary which I have seen, it is ascribed to Seshanága; but, in the body of the work, the commentator calls himself Somákara. [But cf. Weber, *Transact. Berlin Academy*, 1862. See also *suprà* (old ed. vol. i. p. 106); Müller, *Pref. Rig Veda*, vol. iv. p. xxi.]

whole, and contains rules for computing all the possible combinations of long and short syllables in verses of any length.

This author cites earlier writers on prosody, whose works appear to have been lost: such as Saitava, Kraushṭika, Taṇḍin, and other ancient sages, Yáska, Káśyapa, etc.[1]

Pingala's text has been interpreted by various commentators; and, among others, by Haláyudha Bhaṭṭa, author of an excellent gloss entitled Mṛita Sanjívini.[2] It is the work on which I have chiefly relied. A more modern commentary, or rather a paraphrase in verse, by Náráyaṇa Bhaṭṭa Tára, under the title of Vṛittokti Ratna, presents the singularity of being interpreted throughout in a double sense, by the author himself, in a further gloss entitled Paríkshá.

The Agni Puráṇa is quoted for a complete system of prosody,[3] founded apparently on Pingala's aphorisms; but which serves to correct or to supply the text in many places; and which is accordingly used for that purpose by commentators. Original treatises likewise have been composed by various authors;[4] and, among others, by the [65] celebrated poet Kálidása. In a short treatise entitled Śruta Bodha, this poet teaches the laws of versification in the very metre to which they relate; and has thus united the example with the

[1] [Professor Weber gives the authors cited as Kraushṭuki, Yáska, Táṇḍin, Káśyapa, Saitava, Ráta, and Máṇḍavya.]

[2] I possess three copies of it, two of which are apparently ancient; but they have no dates. [Cf. *Ind. Studien*, viii. pp. 192-202.]

[3] It is stated by the authors who quote it (Náráyaṇa Bhaṭṭa and others) to be an extract from the Agni Puráṇa; but I have not been able to verify its place in that Puráṇa. [It is found in the Bodleian MS. See Aufrecht's *Catalogue*, p. 7, *b*.]

[4] Such are the Váṇíbhúshaṇa, Vṛitta Darpaṇa, Vṛitta Kaumudí, and Vṛitta Ratnákara, with the Chhando Manjari, Chhando Mártaṇḍa, Chhando Málá, Chhando Niviti, [perhaps this should be Chhandovichiti, see *Kávyádarśa*, i. 12], Chhando Govinda, and several tracts under the title of Vṛitta-Muktávalí, besides treatises included in works on other subjects. For example, Varáhamihira's system of astrology, which contains a chapter on prosody [ch. 104, cf. *Ind. Stud.* viii. 203-5]. The Vṛitta Ratnákara of Kedára Bhaṭṭa, with its commentaries by Divákara Bhaṭṭa, Náráyaṇa Bhaṭṭa, and Hari Bháskara, has been the most consulted for the present treatise. The Vṛitta Darpaṇa, which relates chiefly to Prákrit prosody, has been also much employed.

precept. The same mode has been also practised by many other writers on prosody; and in particular, by Pingala's commentator Náráyaṇa Bhaṭṭa; and by the authors of the Vṛitta Ratnákara and Vṛitta Darpaṇa.

Kálidása's Śruta Bodha exhibits only the most common sorts of metre, and is founded on Pingala's Prákrit rules of prosody; as has been remarked by one of the commentators[1] on the Vṛitta Ratnákara.

The rules generally cited under the title of Prákrit Pingala, have been explained in a metrical paraphrase, teaching the construction of each species of metre in a stanza of the same measure, and subjoining select examples. This Prákrit paraphrase, entitled Pingala Vṛitti, is quoted under the name of Hammíra,[2] who is celebrated in more than one passage given as examples of metre, and who probably patronized the author. It has been imitated in a modern Sanskrit treatise on Prákrit prosody, entitled Vṛitta Muktávalí;[3] and has been copiously explained in a Sanskrit commentary named Pingala Prakáśa.[4]

Though relative to Prákrit prosody, the rules are applicable, for the most part, to Sanskrit prosody also: since the laws of versification in both languages are nearly the same.

[66]

The Prákrit, here meant, is the language usually employed under this name by dramatic writers; and not, in a more general sense of the term, any regular provincial dialect corrupted from Sanskrit. Hemachandra, in his grammar of Prákrit, declares it to be so called because it is derived from Sanskrit.[5]

Accordingly his and other grammars of the language consist of rules for the transformation of Sanskrit words into the derivative tongue: and the specimens of it in the Indian

[1] Divákara Bhaṭṭa.

[2] In the commentary on the Vṛittokti Ratna.

[3] The author, Durgádatta, was patronized by the Hindúpati princes of Bundelkhand. The examples, which like the text are Sanskrit in Prákrit measure, are in praise of these chieftains.

[4] By Viśwaratha.

[5] "*Prakṛitiḥ sanskṛitam; tatrabhavam tata ágatam vá prákṛitam.*"

dramas, as well as in the books of the Jains, exhibit few words which may not be traced to a Sanskrit origin. This is equally true of the several dialects of Prákrit: viz. Śaurasení or language of Śurasena,[1] and Mágadhí or dialect of Magadha;[2] which according to grammarians, who give rules for deducing the first from Sanskrit, and the second from the first,[3] or both from Sanskrit,[4] are dialects nearly allied to Prákrit, and regularly formed by permutations, for which the rules are stated by them. The same may be said of the Paiśáchí as a language (and distinguished from the jargon or gibberish which either dramatic writers, or actors exhibiting their dramas, sometimes put into the mouths of demons); for [67] the grammarians of Prákrit teach the manner of forming the Paiśáchí[5] from the dialect called Śaurasení.[6] That remark may be also extended to Apabhranśa, as a fixed language partaking of Prákrit and Śaurasení, but deducing many terms immediately from the Sanskrit under rules of permutation peculiar to itself.[7]

The affinity of these dialects of Prákrit to the Sanskrit and to each other is so great, that they reciprocally borrow, notwithstanding their own particular rules, terms permuted in the manner of other dialects, and even admit, without alteration, words inflected according to the Sanskrit grammar.[8]

[1] Kullúka Bhaṭṭa (on Manu 2. 19.) says, that S'urasena is the country of Mathurá.

[2] Kíkaṭa or Bihár. But it does not appear, that either this, or the preceding dialect, is now spoken in the country from which it takes its name. Specimens of both are frequent in the Indian dramas.

[3] Vararuchi, and his commentator Bhámaha.

[4] Hemachandra, who, after stating the special permutations of these dialects as derived from Sanskrit, observes in both places, that the rest of the permutations are the same with those of Prákrit. [Cf. Aufrecht, *Bodl. Cat.* pp. 179, 180.]

[5] Or language of the Piśáchas. "*Piśáchánám bháshá Paiśáchí.*" Bhámaha on Vararuchi.

[6] Vararuchi and Hemachandra. The last-mentioned author notices a variation of this dialect under the name of Chúlikápaiśáchika, which differs very little from the proper Paiśáchí.

[7] It is taught under this name by Hemachandra, among other dialects of Prákrit. But the name usually signifies ungrammatical language.

[8] Hemachandra ad finem.

They may be therefore considered as dialects of a single language, the Prákrit or derivative tongue; so termed with reference to Sanskrit, from which it is derived.

Besides these cognate dialects, the dramatic writers introduced other languages as spoken by different persons of the drama. Such, according to the enumeration in the Sáhitya Darpaṇa,[1] are the Dákshiṇátyá,[2] or language used in the south of India; the Drávidí, or dialect of the southern extremity of the peninsula; the Avantiká (probably the language of Málavá);[3] the Ardha Mágadhí, [68] distinguished from Mágadhí properly so called; the Báhlíkabháshá (perhaps the language of Balkh in the Transoxana);[4] the Mahárashṭrí, or dialect of the Marháṭṭas; the Práchyá, or language employed in the east of India;[5] the Ábhírí and Cháṇḍálí, which, from their names, seem to be dialects used by herdsmen and by persons of the lowest tribes; the Sánkará (Śákárí) and Śábarí, concerning which nothing satisfactory can be at present suggested; and generally any provincial dialect.

It is not to be supposed that the Prákrit rules of prosody, as taught by Pingala, are suited to all these languages: but it is probable that they were framed for the same dialect of Prákrit, in which they are composed; and they are applicable to those cognate dialects, which differ much less from each other (being very easily confounded), than they all do from Sanskrit, their acknowledged common parent. Generally those rules may be considered applicable to all the languages

[1] Ch. 6. [p. 173, Bibl. Ind. ed.]

[2] Same with Vaidarbhí, according to the commentator of the Sáhitya Darpaṇa. The country of Vidarbha is said to be the modern Berar proper.

[3] Avanti is another name of Ujjayaní.

[4] Báhlíka or Bahlíka (for the word is spelt variously) is a country famous for the breed of horses. Amara, 2. 8. 45. It appears to be situated north of India, being mentioned in enumerations of countries, with Turushka, Khasa, Káśmíra, etc. (Hemachandra, 1. 4. 25. Trikáṇḍa S'esha, 2. 1. 9.)

[5] The commentator on the Sáhitya Darpaṇa (Ráma Charaṇa), interprets Práchyá, by Gauḍíyá; meaning, no doubt, the language of Bengal. He was himself a native of this province; and his work is modern, being dated S'áka 1622 (A.D. 1700).

comprehended under the designation of Prákrit,[1] as derivative from Sanskrit; and certainly so to the vernacular tongues of the ten nations of Hindus now inhabiting India. A writer on Sanskrit prosody[2] pronounces the various kinds of metre to be admissible in the provincial languages, and has [69] quoted examples in those of Maháráshṭra, Gurjara, and Kányakubja. The last mentioned, which is the same with the old Hindí, as is demonstrated by this specimen of it, might furnish very numerous instances; especially the Hindí poetry of Keśava Dása,[3] who has studiously employed a great variety of metre. Some examples will accordingly be quoted from the most distinguished Hindí poets. The sacred books of the Sikhs, composed in a Panjábi dialect, which is undoubtedly derived from the ancient Sáraswata,[4] abound in specimens of such metre. The language of Mithilá, and its kindred tongue, which prevails in Bengal, also supply proof of the aptitude of Sanskrit prosody; and the same is probably true of the other four national languages.[5]

Pingala's rules of Sanskrit prosody are expressed with singular brevity. The artifice by which this has been effected is the use of single letters to denote the feet or the syllables. Thus *l*, the initial of a word signifying short (*laghu*), indicates a short syllable: *g*, for a similar reason,[6] intends a long one. The combinations of these two letters denote the several dissyllables: *lg* signifying an iambic; *gl* a trochæus or choreus; *gg* a spondee; *ll* a pyrrhichius. The letters *m*. *y*. *r*. *s*. *t*. *j*. *bh*. and *n*, mark all the trisyllabical feet, from three long syllables to as many short. A Sanskrit verse is generally

[1] As. Res. vii. p. 219. (Page [21], etc., of the present volume.)

[2] Náráyaṇa Bhaṭṭa, in a commentary on the Vṛitta Ratnákara, written in Samvat 1602 (A.D. 1546).

[3] Contemporary with Jahángír and Sháh Jahán.

[4] The remaining Sáraswata Bráhmaṇas inhabit chiefly the Panjáb.

[5] Those of Drávida, Karṇáṭaka, Telinga, and Oḍra or Uḍiya. I omit Gauḍa. The Bráhmaṇas bearing this national designation are settled in the districts around Delhi: but, unless theirs be the language of Mathurá, it is not easy to assign to them a particular national tongue.

[6] Being the initial of *guru*, long.

scanned by these last-mentioned feet, with the addition of either a dissyllable or a mono[70]syllable at the close of the verse, if necessary. This may be rendered plain by an example taken from the Greek and Latin prosody.

Scanned in the Indian manner, a phaleucian verse, instead of a spondee, a dactyl and three trochees, would be measured by a molossus, an anapæst, an amphibrachys, and a trochee; expressed thus *m. s. j. g. l.* A sapphic verse would be similarly measured by a cretic, an antibacchius, an amphibrachys and a trochee; written *r. t. j. g. l.*

To avoid the too frequent use of uncommon terms, I shall, in describing the different sorts of Sanskrit metre, occasionally adopt a mode of stating the measure more consonant to the Greek and Latin prosody, in which the iambic, trochee, and spondee, dactyl, anapæst, and tribrachys, are the only feet of two or three syllables which are commonly employed.

In Prákrit prosody the variety of feet is much greater: verses being scanned by feet of different lengths, from two *mátrás* (two short syllables or one long), to three, four, five, and even six *mátrás* or instants. These various descriptions of feet have been classed, and denominated, by the writers on this branch of prosody.

The verse, according to the Sanskrit system of prosody, is the component part of a couplet, stanza, or strophe, commonly named a *śloka*, although this term be sometimes restricted to one sort of metre, as will be subsequently shown on the authority of Kálidása. The stanza or strophe consists usually of four verses denominated *páda;* or, considered as a couplet, it comprises two verses subdivided into *pádas* or measures. Whether it be deemed a stanza or a couplet, its half, called *ardhaśloka,* contains usually two *pádas;* and in general the pauses of the sense correspond with the principal pauses of the metre, which are accordingly indicated by lines of separation at the [71] close of the *śloka* and of its hemistich. When the sense is suspended to the close of a second *śloka*, the double

stanza is denominated *yugma*; while one, comprising a greater number of measures, is termed *kulaka*. In common with others, I have sometimes translated *śloka* by "verse," or by "couplet;" but, in prosody, it can only be considered as a stanza, though the pauses are not always very perfectly marked until the close of the first half: and, in conformity to the Indian system, it is generally treated as a tetrastich, though some kinds of regular metre have uniform pauses, which might permit a division of the stanza into eight, twelve, and even sixteen verses.

In Prákrit prosody, a greater variety is admitted in the length of the stanza; some species of metre being restricted to a true couplet, and others extended to stanzas of six and even sixteen verses: independently of pauses, which, being usually marked by rhyme, would justify the farther subdivision of the stanza into as many verses as there are pauses. Even in Sanskrit prosody, instances occur of stanzas avowedly comprising a greater or a less number of verses than four; as three, five, six, etc. But these are merely exceptions to the general rule.

Concerning the length of the vowels in Sanskrit verse, since none are ambiguous, it is only necessary to remark, that the comparative length of syllables is determined by the allotment of one instant or *mátrá* to a short syllable, and two to a long one; that a naturally short vowel becomes long in prosody when it is followed by a double or conjunct consonant; [1] and that the last syllable of a verse [72] is either long or short, according to the exigence of the metre,[2] whatever may be its natural length.

[1] Or by the nasal termed Anuswára, or the aspirate Visarga. By poetical licence, a vowel may be short before certain conjuncts (viz., प्र and ह्र; as also ब्र and क्र). This licence has been borrowed from Prákrit prosody, by the rules of which a vowel is allowed to be sometimes short before any conjunct, or before the nasal: but instances of this licence occur in classical poems with only four conjuncts, as above mentioned; and, even there, emendations of the text have been proposed by critics to render the verse conformable to the general laws of prosody. (See remarks in the Durghaṭa-vṛitti, on passages of Mágha's poem and of the Kumára.)

[2] This rule of prosody is applicable to any verse of the tetrastich: but it is con-

Sanskrit prosody admits two sorts of metre. One governed by the number of syllables; and which is mostly uniform or monoschematic in profane poetry, but altogether arbitrary in various metrical passages of the Vedas. The other is, in fact, measured by feet, like the hexameters of Greek and Latin: but only one sort of this metre, which is denominated Áryá, is acknowledged to be so regulated; while another sort is governed by the number of syllabic instants or *mátrás*.

I.—*Gaṇachhandas, or metre regulated by feet.*

A'ryá or Gáthá.

The metre named Áryá, or in Prákrit Gáhá, from the Sanskrit Gáthá, is measured by feet denominated *gaṇa*, or *mátrágaṇa*, which are equivalent to two long syllables or to four short: it is described as a couplet, in which the first verse contains seven and a half feet; and the sixth foot must consist of a long syllable between two short, or else of four short; while the odd feet (1st, 3rd, 5th, and 7th) must never be amphibrachys.[1] In the second verse of the [73] couplet, the sixth foot (for here too it retains that name) consists of a single short syllable. Consequently the proportion of syllabic instants in the long and short verses is thirty to twenty-seven.[2] The same metre has, with some propriety, been described as a stanza of four verses:[3] for it is subdivided by its pauses into four *pádas*, which have the usual privilege of giving to the last syllable, whether naturally long or short, the length required by the metre. The pause is commonly restricted to the close of the third foot, and the measure is in this case denominated

sidered by writers on rhetoric inelegant to use the privilege in the uneven verses; and they thus restrict the rule to the close of the stanza and of its half, especially in the more rigid species of regular metre.

[1] If the rule be violated, the metre is named Gurviṇí; but this is reprobated by writers on prosody.

[2] As. Res., vol. ii., p. 390.

[3] Vṛitta-muktávalí.

Pathyá; but if the pause be placed otherwise in either verse, or in both of them, the metre is named Vipulá.

A particular sort of this measure, deduced from either species above described, is called Chapalá; and the laws of its construction require, that the second and fourth feet should be amphibrachys, and that the first foot should be either a spondee or an anapæst, and the fifth a dactyl or a spondee. The first verse of the couplet, the second, or both, may be constructed according to these rigid rules: hence three varieties of this sort of metre.

The regular Áryá consists of alternate long and short verses: but, if the short verse precede the long one, the metre is called Udgíti. If the couplet consist of two long verses, it is named Gíti: or of two short verses, Upagíti. Another sort of this metre is named Áryá-gíti: it is constructed by completing the eighth foot of the regular Áryá.[1]

This measure admits therefore of eighty principal variations, deducible from the nine sorts above mentioned: for the pause may be placed at the close of the third foot in either verse of each couplet, in both, or in neither; and [74] either verse, both, or neither, may be constructed according to the strict rules of the Chapalá measure; and the verse may consist of seven and a half, or of eight feet; and may be arranged in couplets consisting of verses alternately long and short, or alternately short and long, or else uniformly long, or uniformly short.

The Áryá metre is very frequently employed by Indian poets; but works of great length in this measure are not common. It is oftener intermixed with verses of other kinds, though instances do occur of its exclusive use: thus the first and fourth cantos, and most part of the second and third, in the poem entitled Nalodaya, and the entire work of Govardhana,[2] are in the Áryá metre. And so is the brief text of the

[1] It may be varied by alternating a long and short verse, or a short and a long one, or by making both verses long.

[2] Consisting of seven hundred (or with the introduction 755) stanzas of miscellaneous poetry; and entitled, from the number of stanzas, Sapta-śatí.

Sánkhya philosophy of Kapila, as taught by Íśwara-kṛishṇa;[1] and the copious treatise of astronomy by Brahmagupta.[2]

The Nalodaya above mentioned, which is ascribed to the celebrated poet Kálidása, is a poem in four cantos, comprising 220 couplets or stanzas,[3] on the adventures of Nala and Damayantí: a story which is already known to the English reader.[4] In this singular poem, rhyme and alliteration are combined in the termination of the verses: for [75] the three or four last syllables of each hemistich within the stanza are the same in sound though different in sense. It is a series of puns on a pathetic subject.

It is supposed to have been written in emulation of a short poem (of twenty-two stanzas) similarly constructed, but with less repetition of each rhyme; and entitled, from the words of the challenge with which it concludes, Ghaṭa-karpara.

आलम्ब्य चाम्बु तृषितः करकोशपेयं
भावानुरक्तवनितासुरतैः शपेयम् ।
जीयेय येन कविना यमकैः परेण
तस्मै वहेयमुदकं घटकर्परेण ॥

"Thirsty and touching water to be sipped from the hollow palms of my hands, I swear by the loves of sprightly damsels, that I will carry water in a broken pitcher for any poet by whom I am surpassed in rhymes."

However, the epic poem of Mágha, which will be mentioned more particularly under the next head, contains a specimen of similar alliteration and rhyme; the last fourteen stanzas of the sixth canto (descriptive of the seasons) being constructed

[1] Author of the Káriká or metrical maxims of this philosophy. Sútras, or aphorisms in prose, which are ascribed to Kapila himself, are extant: but the work of Íśwara-kṛishṇa is studied as the text of the Sánkhya (As. Res., vol. viii., p. 466).

[2] Entitled Brahmasphuṭa-siddhánta: other treatises, bearing the same or a similar title, are works of different authors.

[3] Chiefly Áryá, with a few anapæstic stanzas (Toṭaka), and a still smaller number of iambics and trochaics (Pramáṇí and Samání). [Edited by Benary, Berlin, 1830, and Yates, Calcutta, 1844.]

[4] Translated by Mr. Kindersley of Madras, from a tale in the provincial language. [I may add Dean Milman's poetical version.]

with like terminations to each half of the stanza. Instances will also be cited from Bháravi's poem hereafter noticed.

The following example of a species of the Áryá metre is taken from the preface of the Nalodaya.

A'ryá-gíti (8 feet).

Asti sa rájá níte
Rámákhyo, yo gatíh pará jáníte,
yasya rarájá 'níte
ratnáni janaḥ kule dharájání 'te.

- ⏑⏑|- -|--|- -|- -|⏑ -⏑|- -|--|
[76] अस्तिसराजानीतेरामाख्योयोगतीःपराजानीते ।
- ⏑⏑|- -|--|--|⏑⏑-|⏑-⏑| --|--|
यस्यरराजानीतेरत्नानिजनःकुलेधराजानीते ॥

" The king celebrated under the name of Ráma[1] exists, who is conversant with the supreme ways of moral conduct; in whose family, exempt from calamity and enriched with the gems of the earth, dependents flourish." 1. 5.

The next is taken from Damayantí's lamentation on finding herself deserted by her husband Nala. It is in the same species of metre.

26. *Tatra, pade vyálínám,*
atha vibhrántam vane cha devyá, 'línám
taru-vṛinde vyálínám
tatin dadháne, tayă 'spade vyálínám.
27. *Vega-balá 'pásitayá,*
veṇyá, Bhaimí yutá lalápá 'sitayá.
" Nṛipa ! sa-kalápá 'sitayá
hatwá 'rín, bándhaván kilá 'pási tayá.
28. *Sa katham mána-vanánám,*
nyáyavid ! ácharasi sevyamána-vanánám,
dhṛita-símá navanánám,
dáráṇám tyágam, anupamá ! 'navanánám.

[1] Ráma-rája, by whose command the poem was composed. So the commentators remark : but it remains uncertain who he was, or where he reigned.

29. *Para-kṛitam etat twenaḥ* [*tu enaḥ*]
smarámi, tan na smṛito 'si me tattwena,
dosha-sametatwena
pradúshaye ná 'tra sambhrame tat twena! [*twá, ina!*]"

तत्रपद्व्यालीनामथविधांवनेषद्व्यालीनाम् ।
तद्वृन्द्व्यालीनांततिन्दधानेतयासद्व्यालीनाम् ॥
[77] वेगवशापासितयावेश्याभिर्भीयुतालकलापासितया ।
नृपसकलापासितयाहसारीन्बांधवान्विकलापासितया ॥
सदर्पमानवनानांन्यायविदाधरसिसेव्यमानवनानाम् ।
धृतसीमानवनानांदाराणांत्याजनमनुपमानवनानाम् ॥
परकृतमेतत्त्वेनःस्मरामिनस्मृतोसिमेतत्त्वेन ।
दोषसमेतत्वेनप्रदूषयेनात्रसंभ्रमेतत्त्वेन ॥

"Then the princess wandered in the forest, an abode of serpents, crowded with trees which resound with the sweet buzz of bees, the resort of flocks of birds. With her dark hair dishevelled through her haste, Bhaimí thus lamented: 'King! thou slayest foes, but defendest thy kindred, with thy quiver and thy sword. Unrivalled in excellence and conversant with morality, how hast thou practised the desertion of a wife proud but left helpless in a forest; thus rendering thyself the limit of praise? But I consider this evil to be the act of another, and do not charge thee with it: I do not blame thee, my husband, as in fault for this terror.'" 3. 26–29.

In the passage here cited, some variations in the reading and greater differences in the interpretation occur; with which it is, however, unnecessary to detain the reader. After consulting several scholia, the interpretation which appeared preferable has been selected. The same mode will be followed in subsequent quotations from other poems.

[78] II.—*Mátráchhandas, or metre regulated by quantity.*

1. *Vaitáliya.*

Another sort of metre, regulated by the proportion of *mátrás* or syllabic instants, is measured by the time of the syllables exclusively; without noticing, as in the *gaṇachhandas*, the number of feet. It is therefore denominated *mátráchhandas*, and the chief metre of this kind is named Vaitálíya. It is a tetrastich, or strophe of four verses, the first and third containing the time of fourteen short syllables, and the second and fourth sixteen. The laws of its construction impose that each verse shall end in a cretic and iambic, or else in a dactyl and spondee,[1] or by bacchius.[2] In regard to the remaining moments, which are six in the odd verses, and eight in the even verses of the strophe, it must be observed as a general rule, that neither the second and third, nor the fourth and fifth moments should be combined in the same long syllable; nor, in the second and fourth verses, should the sixth *mátrá* be combined with the seventh. That general rule, however, admits of exceptions, and the name of the metre varies accordingly.[3]

Although the Vaitálíya regularly consist of alternate [79] short and long verses, it may be varied by making the stanza consist either of four short or four long verses, admitting at the same time the exception just now hinted.[4]

[1] This variety of the metre is named Ápatáliká. [Weber writes *Ápátaliká.*]

[2] Thus augmented, the measure is called Aupachhandasika. The whole of the last canto of Mágha's epic poem hereafter mentioned is in this metre, and so is the first half of the 13th canto in Bháravi's Kirátárjuníya.

[3] In the even verses of the strophe, if the fourth and fifth moments be combined in one long syllable, contrary to the general rule above mentioned, the metre is named Práchya-vṛitti; or, in the odd verses, if the second and third moments be so combined, the metre is denominated Udíchya-vṛitti: or the rule may be violated in both instances at the same time, and the measure then takes the name of Pravṛittaka.

[4] A tetrastich, consisting of four short verses of the sort called Pravṛittaka, is named Chárubásiní: and one comprising four long verses of that description is termed Aparántiká.

The following is an example of a stanza composed in a species of this metre:

Vaitálíya (Pravṛittaka).

Idam, Bharata-vanśa-bhúbhṛitám,
śrúyatám, śruti-manorasáyanam,
pavitram, adhikam, śubhodayam,
Vyása-vaktra-kathitam, Pravṛittakam.

इदं भरतवंशभूभृतां श्रूयतां श्रुतिमनोरसायनम्।
पवित्रमधिकं शुभोदयं व्यासवक्त्रकथितं प्रवृत्तकम्॥

"Listen to this pure, auspicious, and pleasing history of the kings of the race of Bharata, as uttered from the mouth of Vyása."

Here, as in most of the examples given by the commentator Haláyudha, and by other writers on prosody, the name of the metre occurs, but with a different acceptation. Where the stanza has the appearance of being a quotation (as in the present instance), it might be conjectured that the denomination of the measure was originally assumed from the example; and this conjecture would appear probable, wherever the name (as is frequently the case) has no radical meaning connected with the subject of metre. But, in many instances, the radical interpretation of the word is pertinent, and has obviously suggested its application as a term of prosody; and the stanza, which is given as an example, must therefore have been purposely con[80]structed to exhibit the metre by words in which its denomination is included. This is confirmed by the circumstance of some of the words being incompatible with the measure which they designate: and, in such cases, the author apologizes on that ground for not exhibiting the name in the example.

The Vaitálíya metre has been employed by some of the most eminent poets; for instance, in the epic poem of Mágha, the sixteenth canto of which is chiefly in this measure, as the

twentieth and last canto is in that species of it which is called Aupachhandasika.

The work here mentioned is an epic poem, the subject of which is the death of Śiśupála slain in war by Kṛishṇa: it is entitled Śiśupála-badha, but is usually cited under the name of its author, whose designation, with praises of his family, appears in the concluding stanzas of the poem. Yet, if tradition may be trusted, Mágha, though expressly named as the author, was the patron, not the poet. As the subject is heroic, and even the unity of action well preserved, and the style of the composition elevated, this poem is entitled to the name of epic.[1] But the Indian taste for descriptive poetry, and particularly for licentious description, has disfigured even this work, which is otherwise not undeserving of its high reputation. The first two cantos and the last eight are suitable to the design of the poem; but the intermediate ten, describing the journey of Kṛishṇa with a train of amorous damsels, from Dwáraká to Indraprastha, is misplaced, and in more than one respect exceptionable.

The argument of the poem is as follows. In the first canto Nárada, commissioned by Indra, visits Kṛishṇa and incites him to war with his cousin, but mortal enemy, Śiśupála king of the Chedis. In the second, Kṛishṇa consults with his uncle and brother, whether war should be [81] immediately commenced, or he should first assist Yudhishṭhira in completing a solemn sacrifice which had been appointed by him. The result of the consultation is in favour of the latter measure; and accordingly, in the third canto, Kṛishṇa departs for Yudhishṭhira's capital. In the thirteenth he arrives and is welcomed by the Páṇḍavas. In the following canto the sacrifice is begun; and in the next, Śiśupála, impatient of the divine honours paid to Kṛishṇa, retires with his partisans from the place of sacrifice. A negociation ensues, which is

[1] [A traditional verse is current among the Pandits, *Upamá Kálidásasya Bháraver arthagauravam, Naishadhe padalálityam, Mághe santi trayo guṇáḥ.*]

however ineffectual, and both armies prepare for action. This occupies two cantos. In the eighteenth both armies issue to the field of battle, and the conflict commences. The battle continues in the next canto, which describes the discomfiture and slaughter of Śiśupála's army. In the last canto, the king, grown desperate, dares Kṛishṇa to the combat. They engage, and in the Indian manner fight with supernatural weapons. Śiśupála assails his enemy with serpents, which the other destroys by means of gigantic cranes. The king has recourse to igneous arms, which Kṛishṇa extinguishes by a neptunian weapon. The combat is prolonged with other miraculous arms, and finally Kṛishṇa slays Śiśupála with an arrow.

The following example is from a speech of Śiśupála's ambassador, in reply to a discourse of Sátyaki, brother of Kṛishṇa, at an interview immediately preceding the battle.

विविनक्ति न बुद्धिदुर्विधः
  स्वयमेव स्वहितं पृथग्जनः ।
यदुदीरितमप्यदः परै-
  र्न विजानाति तदद्भुतं महत् ॥ ३९ ॥
[82] विदुरेष्यदपायमात्मना
  परतः श्रद्दधतेऽथवा बुधाः ।
न परोपहितं न च स्वतः
  प्रमिमीतेऽनुभवादृतेऽल्पधीः ॥ ४० ॥
कुशलं खलु तुभ्यमेव त-
  द्वचनं कृष्ण यदभ्यधामहम् ।
उपदेशपराः परेष्वपि
  स्वविनाशाभिमुखेषु साधवः ॥ ४१ ॥
उभयं युगपन्मयोदितं
  त्वरया सान्त्वमथेतरच्च ते ।
प्रविभज्य पृथङ्मनीषया
  स्वगुणं यत्किल तत्करिष्यसि ॥ ४२ ॥

अथवाभिनिविष्टबुद्धिषु
  व्रजति व्यर्थकतां सुभाषितम् ।
रविरागिषु शीतरोचिषः
  करजालं कमलाकरेष्विव ॥ ४३ ॥

"A low man, poor in understanding, does not perceive his own advantage: that he should not comprehend it when shown by others, is surprising. The wise, of themselves, know the approach of danger, or they put trust in others: but a foolish man does not believe information without personal experience. The proposal which I made to thee, Krishṇa, was truly for thy benefit: the generous are ready to advise even their enemies bent on their destruc[83]tion. Peace and war have been offered at the same time by me; judging their respective advantages, thou wilt choose between them. Yet good advice addressed to those whose understanding is astray, becomes vain, like the beams of the cold moon directed towards lakes eager for the warm rays of the sun." 16. 39—43.

Another passage of the same poem is here subjoined as a specimen of a different species of this metre. It is the opening of the last canto, where Śiśupála, impatient of the discomfiture of his troops and those of his allies, dares Krishṇa to single combat.

Aupachhandasika.

मुखमुल्लसितत्रिरेखमुच्चै-
  र्भिदुरभ्रूयुगभीषणं दधानः ।
समिताविति विक्रमानमृष्यन्
  गतभीराह्वत चेदिराट् मुरारिम् ॥

Mukham ullasita-tri-rekham uchchair
  bhidura-bhrú-yuga-bhíshaṇan dadhánaḥ,
Samitáv iti vikramán amṛishyan,
  gatabhír, áhwata Chedirád Murárim.

"Raising his head, and with a countenance terrible by its forked brow and wrinkled forehead, the king of the Chedis,

impatient of the prowess thus displayed in battle, banished fear, and challenged the foe of Mura to the fight." 20. 1.

A further example of the same metre is the second stanza of the following extract from the Kirátárjuníya[1] of Bháravi. The remaining stanzas exhibit variety of measure, with two instances of singular alliteration.

[84] The subject of that celebrated poem is Arjuna's obtaining celestial arms from Śiva, Indra, and the rest of the gods, to be employed against Duryodhana. It is by a rigid observance of severe austerities in the first instance, and afterwards by his prowess in a conflict with Śiva (in the disguise of a mountaineer), that Arjuna prevails. This is the whole subject of the poem; which is ranked with the Kumára and Raghu of Kálidása, the Naishadhíya of Śríharsha, and Mágha's epic poem, among the six excellent compositions in Sanskrit. The sixth is the Meghadúta, also ascribed to Kálidása; and, on account of its excellence, admitted among the great poems (Mahákávya), notwithstanding its brevity.

अनुचरेण धनाधिपतेरथो
  नगविलोकनविस्मितमानसः ।
स जगदे वचनं प्रियमादरा-
  न्मुखरतावसरे हि विराजते ॥ १६ ॥
अलमेष विलोकितः प्रजानां
  सहसा संततिमंहसां विहन्तुम् ।
घनवर्त्म सहस्रधेव कुर्वन्
  हिमगौरैरचलाधिपः शिरोभिः ॥ १७ ॥
इह दुरधिगमैःकिंचिदेवागमैः
  सततमसुतरं वर्णयन्त्यन्तरम् ।
अमुमतिविपिनं वेद दिग्व्यापिनं
  पुरुषमिव परं पद्मयोनिः परम् ॥ १८ ॥

[1] Arjuna and the mountaineer. Kiráta is the name of a tribe of mountaineers considered as barbarians.

रुचिरपल्लवपुष्पलतागृहै
रुपलसज्जलजैर्जलराशिभिः ।
[85] नयति सन्ततमुत्सुकतामयं
धृतिमतीरुपकान्तमपि स्त्रियः ॥ १९ ॥
सुलभैस्सदा नयवतायवता
निधिगुह्यकाधिपरमैः परमैः ।
अमुना धनैः क्षितिभृतातिभृता
समतीत्य भाति जगती जगती ॥ २० ॥

The stanzas, which contain alliteration, are here copied in Roman characters.

18. *Iha duradhigamaiḥ*
kinchid evágamaiḥ
satatam asutaram
varṇayantyantaram.
Amum ativipinam
veda digvyápinam
purusham iva param
Padmayoniḥ param.
20. *Sulabhaiḥ sadá nayavatá 'yavatá*
nidhi-guhyakádhipa-ramaiḥ paramaiḥ
amuná dhanaiḥ kshitibhṛitá 'tibhṛitá
samatítya bháti jagati jagati.

"Then Arjuna, admiring the mountain in silent astonishment, was respectfully addressed by his conductor, Kuvera's attendant: for even loquacity is becoming in its season.

"'This mountain with its snowy peaks rending the cloudy sky in a thousand places, is, when viewed, able to remove at once the sins of man. An imperceptible something within it, the wise ever demonstrate to exist by proofs difficultly apprehended. But Brahmá alone thoroughly knows this vast and inaccessible mountain, as he alone [86] knows the supreme soul. With its lakes overspread by the bloom of lotus, and overshadowed by arbours of creeping plants whose foliage and

blossoms are enchanting, the pleasing scenery subdues the hearts of women who maintained their steadiness of mind even in the company of a lover. By this happy and well-governed mountain, the earth, filled with gems of easy acquisition and great excellence, delightful to the god of riches, seems to surpass both rival worlds."[1] 5. 16—20.

2. *Mátrásamaka.*

The metre denominated Mátrásamaka consists of four verses, each of which contains the quantity of sixteen short syllables; and in which the last syllable must be a long one; and the ninth syllabic moment must be in general detached from the eighth and tenth, and be exhibited of course by a short syllable: if the twelfth be so likewise, the metre is distinguished by another name; or if the fifth and eighth remain short, the denomination is again changed. The last sort of metre is varied by deviating from the rule respecting the ninth moment; and another variety exhibits the fifth, eighth, and twelfth moments by short syllables.[2] These five varieties of the metre called Mátrásamaka may be variously combined in the same stanza; and in that [87] case the measure is denominated Pádákulaka; a name which is applied with greater latitude in Prákrit prosody, to denote a tetrastich wherein each verse contains sixteen moments, without any other restriction as to the number and place of the long and short syllables.

[1] The first and fourth stanzas, in this quotation, are in the Drutavilambita metre, and the fifth in the Pramitákshará; which will be both noticed under a subsequent head. The third is an uncommon measure named Chandriká or Kshamá.

[2] The names of these four varieties are 1st, Vánavásiká, which exhibits the ninth and twelfth moments by short syllables, and the fifteenth and sixteenth by a long one: the rest being optional. 2ndly, Chitrá, exhibiting the fifth, eighth, and ninth, by short syllables, the fifteenth and sixteenth by a long one. 3rdly, Upachitrá, the fifth and eighth short; the ninth and tenth long; also the fifteenth and sixteenth long. 4thly, Viśloka, fifth, eighth, and twelfth short; fifteenth and sixteenth long; and the rest indeterminate. [Cf. *Ind. Stud.* viii. 314-318.]

A poem inserted in the first volume of Asiatic Researches[1] is a specimen of the variety which this sort of metre admits. In a collection of tales entitled Vetála-panchavinśati, the author, Śivadása, has quoted several stanzas of that poem intermixed with others, in which the measure is still more varied: and I may here remark, that the introduction of rhyme into Sanskrit verse is not peculiar to this anapæstic metre: Jayadeva has adopted it with success in several other sorts of lyric measure, and it is frequent in Sanskrit poetry composed in any species of Prákrit metre.

3. *Gítyáryá.*

Another species of metre regulated by quantity is named Gítyáryá. Like the preceding, it is a tetrastich, in which each verse consists of sixteen *mátrás* or moments, but all expressed by short syllables. In other words the stanza contains sixty-four short syllables distributed into four verses. From the mixture of verses of this description with others consisting exclusively of long syllables, arises another metre, distinguished into two sorts, according as the first couplet in the stanza consists of short syllables and the second of long; or, conversely, the first long and the second short.[2] The Gítyáryá may be further varied by making the last syllable of each couplet long and all the rest short; at the [88] same time reducing both couplets to twenty-nine moments; or the first only to that measure, and the second to thirty-one; or the first couplet to thirty, while the second contains thirty-two.[3]

[1] Page 35.

[2] The mixed metre, in which one couplet of the stanza contains short syllables and the other long, is termed S'ikhá or Chúḍá. If the first couplet contain the short syllables, it is denominated Jyotis; but it is called Saumyá or Anangakríḍá, when the first couplet consists of long syllables.

[3] This metre, concerning which authorities disagree, is called Chúḍiká or Chúliká; or, according to the Vṛitta-ratnákara, Atiruchirá.

4. *Prákrit measures.*

The foregoing are all comprehended under the general designation of Játi: and besides these, which are noticed in treatises on Sanskrit prosody, other kinds belonging to the class of metre regulated by quantity, are specified by writers on Prákrit prosody. They enumerate no less than forty-two kinds, some of which comprehend many species and varieties. The most remarkable, including some of those already described as belonging to Sanskrit prosody, are the following, of which instances are frequent in Prákrit, and which are also sometimes employed in Sanskrit poetry.

A stanza of four verses, containing alternately thirteen and eleven moments (and scanned 6+4+3 and 6+4+1), is named either Dohá[1] (S. Dwipathá) or Soratṭhá (S. Sauráshṭra), according as the long verse precedes the short one, or the contrary. This metre, of which no less than twenty-three species bear distinct names (from forty-eight short syllables to twenty-three long and two short), is very commonly used in Hindí poetry. As an instance of it, the work of Bihárilál may be mentioned, which consists of seven hundred couplets (*sat saï*) all in this measure. It is a collection of descriptive poetry; of which Kṛishṇa, sporting with Rádhá and the Gopís, is the hero. The following example is from that celebrated author.

[89] मकराकृत गोपालके कुण्डल झलकत कान।
धस्यो मनोहिय गढ समर ड्योढी लसत निसान॥

Makarákṛita Gopála ke
kuṇḍala jhalakata kána,
Dhasyo manohiya gaḍha samara,
ḍyoḍhí lasata nisána.

"The dolphin-shaped ring, which glitters in Gopála's ear, may be taken for the symbol of Cupid suspended at the gate, while the god is lodged in his heart."

[1] CorruptlyDohra.

To understand this stanza it must be remarked, that the symbol of the Indian cupid is the aquatic animal named Makara (which has in the Hindu zodiac the place of Capricorn). It is here translated dolphin, without however supposing either the deliverer of Arion, or any species of dolphin (as the term is appropriated in systems of natural history), to be meant.

The Gáthá or Gáhá has been already noticed as a name of the A'ryá measure in Prákrit prosody. Including under this as a general designation the seven species of it, with all their numerous varieties, it is no uncommon metre in Prákrit poetry. A collection of amatory verses ascribed to the famous monarch Śáliváhana, comprising seven hundred stanzas,[1] and purporting to be a selection from many thousands by the same author, is exclusively in metre of this kind. The introductory verse intimates that

"Seven hundred couplets (*gáhás*) are here selected out of ten millions of elegant couplets composed by the poet Hála."

Hála is a known title of Śáliváhana, and is so explained both here and in a subsequent passage by the [90] scholiast Gangádhara Bhaṭṭa. It is not, however, probable, that he really composed those verses: and it would be perhaps too much to conjecture, that the true author of them was patronized by that monarch, whose existence as an Indian sovereign has been brought in doubt.

The metre called Mahárásḥṭra (in Prákrit Marahaṭṭá) is a tetrastich, of which each verse contains twenty-nine *mátrás*, scanned by one foot of six, and five of four; with a terminating trochee. It has pauses at the eighteenth and twenty-ninth *mátrás*. This measure is evidently denominated from the country which gives name to the Marahaṭṭa nation: as another species, before mentioned, takes its designation from Saurásḥṭra or Soraṭṭha.[2] The circumstance is remarkable.

[1] From their number, entitled Sat Saï. [Prof. Weber edited and translated about half the work in the *Abhanglungen für die Kunde des Morgenlandes*, vol. v.]

[2] The peninsula, between the gulfs of Cambay and Cutch. The name remains,

Another tetrastich, which it is requisite to notice, is denominated Rolá. Each verse contains twenty-four *mátrás:* and this species of metre admits twelve varieties, from twenty-four short syllables to eleven long and two short, bearing distinct names.

The Shaṭpadiká (Pr. Chhappäá) is a stanza of six verses, arranged in a tetrastich and couplet; the first termed Kávya, and the second Ullála. In the tetrastich, each verse contains twenty-four moments (scanned 2 + five times 4+2, or else 6 + four times 4+2) with a pause at the eleventh moment; and each verse of the couplet contains twenty-eight moments, with a pause at the fifteenth. The varieties are extremely numerous, according to the [91] number and the places of the long and short syllables. No fewer than forty-five variations of the tetrastich, and seventy-one of the whole stanza, have separate names. They are distinguished by the number of short and long syllables (from 152 short to 70 long and 12 short in the whole stanza, or from 96 short to 44 long and 8 short in the tetrastich). The following example is extracted from the Pingala·Vṛitti.

Chhappäá or Shaṭpadiká.

Pindhäu diḍha saṇṇáha; báha uppara pakhkhara daï,
Bandhu samadi, raṇa dhaläu. Sámi Hammíra baäṇa laï,
Uḍuu ṇaha; paha bhamäu; khagga ríu sísa hi jháläu.
Pakhkhara pakhkhara, ṭhelli pelli, pabbaä appáräu.
Hammíra kajja Jajjalla bhaṇa, koháṇala mahu maha jaläu.
Sulatána sísa karabála daï, tejji kalevara, däa chaläu.

पिंधउ दिढ सणाह बाह उप्पर पक्खर दइ ।
बन्धु समदि रण धलउ सामि हम्मीर बअण लइ ॥

but the boundaries of the province are more restricted than in ancient times. It still, however, includes the remains of Kṛishṇa's city of Dwárká; the celebrated temple of Somanátha, so frequently plundered by the Muhammadans; and the mountain of Giranára, held sacred by the Jainas no less than by the followers of the Veda.

उड्डउ णह पह भमउ खग्ग रिउ सीस हि झल्लउ ।
पक्खर पक्खर ठेल्लि पेल्लि पव्वअ अप्फालउ ॥
हम्मीर कज्ज जज्जल भणइ कोहाणल मज्झ मह जलउ ।
सुलताण सीस करवाल दइ तेज्जि कलेवर दिअ चलउ ॥

Jajjala, general of Hammíra's forces, taking the field against the Muhammadan emperor, says vauntingly:

"I put on strong armour, placing barbs on my horse, and taking leave of kinsmen, I hasten to the war. Having received the commands of my master Hammíra, I fly through the sky; I pursue the road; I flourish my scimitar on the head of the foe. Amid the bustle of horse [92] and foot I scale mountains. In Hammíra's cause, Jajjala declares, The fire of wrath burns within me; laying my sword on the head of the Sultán, and abandoning this corporeal frame, I ascend to heaven."

The emperor, whose death was thus vainly promised to Hammíra by his braggart general, must have been Sultán Muhammad Khúní, with whom he is stated to have been contemporary, and who reigned from A.D. 1325 to 1351.[1] Hammíra was sovereign of Śákambharí, which, with unfeigned deference for the opinion of Captain Wilford on a geographical question, I still think to be Sámbher:[2] and for this simple reason, that the culinary salt brought from the lakes of Sámbher is named in Sanskrit *S'ákambharíya lavaṇa*, answering to the Hindí *Sámbher láun.* It is, however, proper to remark, that maps exhibit a place of the name of Sambhere between Ujjayaní and Indor.

The Utkachhá is a stanza of six verses, each comprising eleven moments (scanned 4+4+3). It admits eight species from sixty-six short syllables to twenty-eight long and ten short.

The Kuṇḍaliká is composed of one stanza of the metre named Dohá, followed by another in the measure called Rolá:

[1] As. Res. vol ix., p. 192. [2] As. Res. vol. vii., p. 511.

the entire stanza consequently comprises eight verses. In this species of metre, rhyme and alliteration are so appropriate ornaments, that it admits the repetition of a complete hemistich or even an entire verse: as in the following example extracted from the Pingala-vṛitti.

Kuṇḍaliká or Kuṇḍaliá.

Ḍhollá máriä Ḍhilli maha, muchhïa Mechha sarira,
Pura Jajjallá malla bara, chalia bira Hammira.
[93] *Chalia bira Hammira, páä bhara meïṇi kampaï.*
Diga maga ṇaha andhára dhúli súraha raha jhampaï.
Diga maga ṇaha andhára áṇu. Khurasáṇaka ollá
Davali, damasi vippakhkha: máru Ḍhilli maha ḍhollá.

ढोल्ला मारिअ ढिल्लि मह मुच्छिअ मेच्छ सरीर ।
पुर जज्जल्ला मल्लवर चलिअ बीर हम्मीर ॥
चलिअ बीर हम्मीर पाअ भर मेइणि कंपइ ।
दिग मग णह अंधार धूलि सूरह रह झंपइ ॥
दिग मग णह अंधार आणु खुरसाणक ओल्ला ।
दवलि दमसि विप्पक्ख मारु ढिल्ली मह ढोल्ला ॥

"Having made the barbarians faint at the sound of the drum beaten in the midst of Dhillí and preceded by Jajjala, eminent above athletes, the hero Hammíra advances; and as the hero Hammíra advances, the earth trembles under his feet. The cloud of dust, raised by the march of his multitudes, obscures the chariot of the sun. Darkness spreads with the march of his multitudes. The hostages of the Khorasanian are slain; the foe is slaughtered, and the drum is beat in the midst of Dhillí."

A stanza of nine verses, composed of one of five with a tetrastich of the metre called Dohá subjoined to it, is denominated Raḍḍhá. Here the stanza of five contains three verses of fifteen moments each, with two of twelve and eleven interposed. The distribution of the feet, together with a

restriction as to the terminating one, varies in each verse: and a difference in the regulation of the feet gives rise to six varieties which have distinct appellations.

The Chatushpadiká (Pr. Chäupaïa or Chaupáï) is a stanza of sixteen verses distributed into four tetrastichs, in which each verse contains thirty moments (scanned seven [94] times 4+2), and terminated by a long syllable. This measure is of very frequent use in the poetry of the modern languages. The Rámáyaṇa of Tulaśídása, in seven cantos, a poem held in great estimation by Hindus of the middle tribes, is composed chiefly in a similar metre under the same name (Chaupáï), and containing the same number of verses (sixteen) in the stanza. It alternates with the Dohá, and very rarely gives place in that poem to any other metre.

In this metre the stanza contains the greatest number of verses of any admitted into Prákrit prosody. The other measures regulated by quantity are tetrastichs, except the Ghaṭṭá and certain other couplets noticed at the foot of the page;[1] some of which might have been ranked with more propriety under the next head of uniform metre.

One other measure which is placed in this class, but which belongs rather to another, remains to be noticed. It is an irregular stanza of four verses, containing alternately seventeen and eighteen syllables, with no regulation of their length or of the quantity of the verse or stanza. It is termed Gandha, or in Prákrit Gaṇdháṇa.

The rest of the Prákrit metres may be sought in the synoptical tables subjoined to this essay.

The present may be a proper place for noticing a class of

[1] The Ghaṭṭá and Ghaṭṭánanda, consisting of two verses of thirty-one *mátrás* each. In the first species the pauses are after the tenth and eighteenth *mátrás*; in the other after the eleventh and eighteenth. There is also a slight difference in the distribution of the feet (7 times 4+3 short; and 6+3 times 3+5+6+3+3 short). The Dwipadiká has in each verse twenty-eight *mátrás* (6+ five times 4+1 long). The S'ikhá containing the like number, the Khanjá with forty-one *mátrás* to the verse, and the Málá with forty-five, are couplets; but the feet are strictly regulated.

poetry which has been even more cultivated in the Prákrit and provincial languages than in Sanskrit. I allude to the erotic poetry of the Hindus.

[95] On its general character I shall briefly observe, that it is free from the grievous defects of the Hindí poems composed in the style and metre of Persian verse; but it wants elevation of sentiment and simplicity of diction. The passion, which it pictures, is sensual, but the language refined, with some tenderness in the expression and in the thoughts. Among the most celebrated poems in this class may be mentioned the Chaura-panchásiká, comprising fifty stanzas, by Chaura,[1] and Amaru-śataka, containing twice that number, by Amaru.[2] The first is supposed to be uttered by the poet Chaura, who, being detected in an intrigue with a king's daughter, and condemned to death, triumphs in the recollection of his successful love. The other, which is a collection of unconnected stanzas on amatory topics, is reputed to be the work of the great Śankara A'chárya, composed by him in his youth, before he devoted himself to the study of theology.[3]

Some of the commentators on this poem have attempted to explain it in a devout and mystical sense, on the same principle upon which Jayadeva's lyric poems are interpreted as bearing a religious meaning. The interpretation, however, is too strained to be admitted; and though Jayadeva's intention may have been devout, and his meaning spiritual, Amaru, or whoever was the true author of the work bearing this name, is clearly the lover of an earthly mistress.

The most singular compositions in this class of poetry, and for which chiefly a notice of it has been here introduced, are those in which the subject is treated with the studied arrange-

[1] [Edited with Schol. by Bohlen, 1833.] [2] [Often printed.]

[3] [In the legendary memoirs of S'ankara, this singular episode in the great philosopher's life is represented as connected with his unsuccessful contest with Maṇḍana Miśra's queen. In consequence of his defeat, he enters a dead king's body, and remains buried in the pleasures of the harem until he is aroused by his disciples to a better consciousness. See A'nandagiri, ch. 57-59.]

ment and formal precision of the schools. I shall instance the Rasamanjarí of Bhánudatta Miśra in Sanskrit, and the works of Matiráma and Sundara in Hindí. Here various descriptions of lovers and mis[96]tresses distinguished by temper, age, and circumstances, are systematically classed and logically defined, with the seriousness and elaborate precision of scholastic writers. As ridicule was not intended, these poems are not humorous but trifling: and I should not have dwelt on the subject, if their number, and the recurrence of them in different languages of India, were not evidence that the national taste is consulted in such compositions.

III.—*Varṇa-vṛitta; metre regulated by the number of syllables.*

The next sort of metre is that which is measured by the number of syllables; it is denominated Aksharachhandas or Varṇa-vṛitta, in contradistinction to the preceding kinds which are regulated by quantity; and it may be subdivided into three sorts, according as the verses composing the stanza are all similar, or the alternate alike, or all dissimilar.

This also is a stanza of four verses (*pádas*), each containing an equal number of syllables, the length of which is regulated by special rules. The number of syllables varies from twenty-four to a hundred and four, in each strophe: this is, from six to twenty-six in each verse. There are indeed names in Prákrit prosody for verses from one to five syllables, and instances of Sanskrit verse containing a higher number than above stated, *viz.* from twenty-seven to one less than a thousand. But these constitute distinct classes of metre. Between the limits first mentioned, twenty-one kinds receive different appellations appropriate to the number of syllables contained in the stanza.

Each kind comprehends a great variety of possible metres, according to the different modes in which long and short syllables, as well as pauses, may be distributed; and [97]

since the four quarters of each stanza may be either all alike, or only the alternate similar, or all different, the variety of possible metres is almost infinite. Pingala, however, gives directions for computing the number of species, and for finding their places, or that of any single one, in a regular enumeration of them; or conversely, the metre of any species of which the place is assigned: and rules have been given even for calculating the space which would be requisite for writing down all the various species.

In the first class or kind, wherein the verse consists of six syllables, sixty-four combinations are computed on the syllables of each verse; 4096[1] on those of the half stanza; and 16,777,216[2] on the twenty-four syllables which constitute the complete stanza of this class. In the last of the twenty-one kinds, 67,108,864 combinations are computed on twenty-six syllables within each verse; nearly 4,503,621,000,000,000, on fifty-two syllables; and more than 20,282,388,000,000,000,000,000,000,000,000, on a hundred and four syllables which form the stanza.[3]

The different sorts, which have been used by poets, are few in comparison with the vast multitude of possible metres. Still they are too numerous to be all described at full length. I shall therefore select, as specimens, those sorts of metre which are most frequently employed, or [98] which require particular notice; referring for the rest to the subjoined tables, in which the various kinds are succinctly exhibited by single letters descriptive of feet scanned in the Indian and in the Latin mode.

In the best Sanskrit poems, as those of Kálidása, Bháravi,

[1] *Viz.* 64 uniform and 4032 half equal.

[2] *Viz.* 64 uniform, 4032 half equal, and 16,773,120 unequal or dissimilar.

[3] A mode of calculating the possible varieties of metre is also taught in the Lílávatí, a treatise of arithmetic and geometry, by Bháskara. This truly learned astronomer was also a poet, and his mathematical works are composed in highly polished metre. If the reader figure to himself Euclid in Alcaic measure, Diophantus in anapæsts, or the Almagest versified with all the variety of Horatian metre, he will form an adequate notion of this incongruity.

Śríharsha, Mágha, etc., the poet usually adheres to the same, or at least to similar metre, throughout the whole of the canto;[1] excepting towards the close of it, where the metre is usually changed in the last two or three stanzas, apparently with the intention of rendering the conclusion more impressive. Sometimes, indeed, the metre is more irregular, being changed several times within the same canto, or even altering with every stanza.

The Rághava-páṇḍavíya, by Kavirája,[2] is an instance of a complete poem, every canto of which exhibits variety of metre. This extraordinary poem is composed with studied ambiguity; so that it may, at the option of the reader, be interpreted as relating the history of Ráma and other descendants of Daśaratha, or that of Yudhishṭhira and other sons of Páṇḍu. The example of this singular style of composition had been set by Subandhu in the story of Vásavadattá,[3] and Báṇabhaṭṭa in his unfinished work entitled Kádambarí;[4] as is hinted by Kavirája. Both these works, which, like the Daśakumára[5] of Daṇḍí, are prose compositions in poetical language, and therefore reckoned among poems, do indeed exhibit continual instances of terms and phrases employed in a double sense: but not, like the Rághava-páṇḍavíya, two distinct stories told in the same words.

[99] The following passage will sufficiently explain the manner in which the poem is composed. The first stanza is of the mixed sort of metre named Upajáti, which will be immediately described; the second is in one of the measures composing it, termed Upendravajra.

[1] Writers on rhetoric (as the author of the Sáhitya-darpaṇa and others) lay it down as a maxim, that the metre and style should in general be uniform in each canto: but they admit occasional deviations in regard to the metre.

[2] So the author has called himself. [Printed at Calcutta, 1854.]

[3] [Edited by Dr. Hall in the *Bibl. Ind.*]

[4] [Twice printed at Calcutta.]

[5] [Edited by Prof. Wilson, and several times printed in Calcutta.]

मातुः श्रियं संदधदिन्दुमत्याः
श्लाघ्यः शरत्काल इवोडुपंक्तेः ।
असौ प्रजापालनदक्षभावा-
दजस्य चक्रे मनसः प्रमोदम् ॥ ५० ॥
विचित्रवीर्यस्य दिवं गतस्य
पितुः स राज्यं प्रतिपद्य बाल्ये ।
पुरीमयोध्यां धृतराष्ट्रभद्रां
सहस्तिशोभां सुखमध्युवास ॥ ५१ ॥

50. *Máturh śriyan sandadhad Indumatyáḥ*
ślághyaḥ śaratkála ivoḍupankteḥ,
Asau, prajápálanadakshabhávád,
Ajasya chakre manasaḥ pramodam.

52. *Vichitravíryasya divan gatasya*
pituḥ sa rájyam pratipadya bálye,
Purím Ayodhyám, Dhṛitaráshṭrabhadrám,
sahastiśobhám sukham adhyuvása.

"Having the beauty of his mother Indumatí, and admirable like the dewy season when it enjoys the beauty of the stars, he (Daśaratha) made glad the mind of Aja[1] by his skill in the protection of the people. Succeeding in youth to the kingdom of his variously valiant father, who departed for heaven, he dwelt happily in the [100] city of Ayodhyá, which was adorned with elephants and upheld the prosperity of his realm."

Otherwise interpreted the same passage signifies,

"Having the beauty of his mother, and admirable like the dewy season when it enjoys the beauty of the stars and of the moon, he (Páṇḍu) made glad the heart of the unborn god by his skill in the protection of creatures. Succeeding in youth to the kingdom of his father Vichitravírya,[2] who departed for

[1] Aja was father and Indumatí mother of Daśaratha.
[2] Vichitravírya was husband of Páṇḍu's mother.

heaven, he dwelt happily in the peaceful city of Hastinápura auspiciously inhabited by Dhṛitaráshṭra." 1. 50. and 51.

To proceed with the subject. In general the different sorts of verse which are contained in the subjoined synoptical table of uniform metre, are used singly, and the stanza is consequently regular: but some of the species, differing little from each other, are intermixed. Thus the Indravajra, measured by a dactyl between two epitrites (third and second), and the Upendravajra, which begins with diiambus, may be mixed in the same stanza. This sort of mixt metre (an example of which has been just now exhibited) is denominated Upajáti: it of course admits fourteen variations;[1] or, with the regular stanzas, sixteen. The relief which it affords from the rigorous laws of the uniform stanza, renders it a favourite metre with the best poets. It has been much employed by Kálidása, in whose poem on the birth and marriage of Párvatí, three out of the seven cantos which compose it are in this metre; as are eight out of nineteen in his heroic poem on the glory of the race of Raghu.

The last-mentioned work, which is entitled Raghuvanśa, [101] and is among the most admired compositions in the Sanskrit tongue, contains the history of Ráma and of his predecessors and successors, from Dilípa father of Raghu, to Agnivarṇa, a slothful prince who was succeeded by his widow and posthumous son. The first eight cantos relate chiefly to Raghu, with whose history that of his father Dilípa, and of his son Aja, is nearly connected. The next eight concern Ráma, whose story is in like manner intimately connected with that of his father Daśaratha and of his sons Kuśa and Lava. The three concluding cantos regard the descendants of Kuśa, from Atithi to Agnivarṇa, both of whom are noticed at considerable length; each being the subject of a single canto, in which their characters are strongly contrasted; while the in-

[1] They have distinct names, which are enumerated in the Chhandomártaṇḍa, cited by the commentator on the Vṛitta-ratnákara: as Maṇiprabhá, Kántimatí, etc.

termediate princes, to the number of twenty, are crowded into the intervening canto, which is little else than a dry genealogy.

The adventures of Ráma are too well known to require any detailed notice in this place. The poet has selected the chief circumstances of his story, and narrates them nearly as they are told in the mythological poems and theogonies, but with far greater poetical embellishments. Indeed, the general style of the poems esteemed sacred (not excepting from this censure the Rámáyaṇa of Válmíki,) is flat, diffuse, and no less deficient in ornament than abundant in repetitions; and it is for this reason that examples have been selected, for the present essay, exclusively from the celebrated profane poems. Ráma's achievements have been sung by the profane as frequently as by the sacred poets. His story occupies a considerable place in many of the Puráṇas, and is the sole object of Válmíki's poem, and of another entitled Adhyátma-rámáyaṇa,[1] which is ascribed to Vyása. A fragment of a Rámáyaṇa, attributed to Baudháyana, is current in the southern part of the Indian peninsula; and the great [102] philosophical poem, usually cited under the title of Yoga-vásishṭha,[2] is a part of a Rámáyaṇa, comprising the education of the devout hero. Among profane poems on the same subject, the Raghuvanśa and Bhaṭṭikávya with the Rághava-páṇḍavíya before mentioned, are the most esteemed in Sanskrit, as the Rámáyaṇa of Tulaśídása and Rámachandriká of Keśavadása are in Hindí. The minor poets, who have employed themselves on the same topic, both in Sanskrit and in the Prákrit and provincial dialects, are by far too numerous to be here specified.

The other poem of Kálidása above mentioned, though entitled Kumára-sambhava or orign of Kumára (who is son of Párvatí), closes with Párvatí's wedding. It has the appearance of being incomplete; and a tradition runs, that

[1] [Printed in Bombay and Benares with a Comm.]
[2] [Printed in Bombay, 1865.]

it originally consisted of twenty-two books.[1] However, it relates the birth of the goddess as daughter of mount Himálaya, and celebrates the religious austerities by which she gained Śiva for her husband; after Kandarpa, or Cupid, had failed in inspiring Śiva with a passion for her, and had perished (for the time) by the fiery wrath of the god. The personages, not excepting her father, the snowy mountain, are described with human manners and the human form, with an exact observance of Indian costume.

The following stanza from a poem in mixed language upon the same subject (the birth of Kumára), is selected as a further example of Upajáti metre, and as a specimen of the manner in which Sanskrit and Prákrit are sometimes intermixed. It is quoted for that purpose in the Pingalavṛitti.

बालः कुमारः स छमुण्डधारी
उपाअहीणा हमु एक्कणारी ।
अहर्णिशं खाइ विषं भिखारी
गतिर्भविची किल का हमारी ॥

[103] *Bálaḥ kumáraḥ; sa chha-muṇḍa-dhárí.*
Upáä-hiṇá hamu ekka-ṇárí.
Ahar-ṇiśam kháï visham bhikhárí.
Gatir bhavitrí kila ká hamárí.

Deví, grieving over her infant son Kumára or Skanda, says, "The child is an infant, but he has six mouths [to be fed]: I am a helpless, solitary female: night and day my mendicant husband swallows poison: what resource is there, alas! for me?"

An instance of the same measure used in the Marahaṭṭa (Maháráshṭra) language is quoted by the commentator on the Vṛitta-ratnákara. It appears, however, from the rhymes, that the verse is there subdivided by a pause after the fifth syllable.

[1] [The remaining books are generally considered spurious, though the eighth is quoted with the author's name *(iti Kálidásaḥ)* in the second book of the Sankshiptasára, and without mentioning any name in the Daśarúpa iv. § 12, and Sáhityadarpaṇa, iii. § 218. They have been printed in Calcutta.]

The variety of the Upajáti metre is increased by the further mixture of two sorts of iambic measure named Vanśastha[1] and Indravanśá. The first is composed of a choriambus between two diiambi; in the second, the first dissyllable is a spondee instead of an iambic. Instances of this mixt metre occur in Válmíki's Rámáyaṇa,[2] in the Śrí Bhágavata-puráṇa,[3] and in a metaphysical and theological drama entitled Prabodha-chandrodaya.[4]

The following example from the drama now mentioned exhibits the combination of those four sorts of metre in a single stanza.

विद्याप्रबोधोदयजन्मभूमि-
वाराणसी मुक्तिपुरी निरत्यया ।
[104] अतः कुलोच्छेदविधिं विधित्सु-
र्निवस्तुमत्रेच्छति नित्यमेव सः ॥

Vidyá-prabodhodaya-janma-bhúmir,
Váráṇasí mukti-purí niratyayá
Ataḥ kulochchheda-vidhim vidhitsur
nivastum atrechhati nityam eva saḥ.

"Váráṇasí, the indestructible city of eternal salvation, is the native land of science and intellect: hence, one desirous of observing the precepts by which a continuance of family is cut off [and final beatitude obtained], is solicitous to dwell there continually."

The same term (Upajáti), as descriptive of mixt metre, has been also applied to the intermixture of two spondaic measures named Vátormí and Śáliní; which are very similar, the first having an anapæst, the other a cretic, between a dispondeus

[1] [Weber writes Vanśasthá.]

[2] In a passage of the Sundara-káṇḍa.

[3] Book 10th.

[4] Among the persons of this drama are the passions and vices (pride, anger, avarice, etc.) with the virtues (as pity and patience), and other abstract notions, some of which constitute very strange personifications. The author was Kṛishṇa Paṇḍita. [This was edited by Brockhaus, 1845, and anonymously translated into German by Goldstücker. It was translated into English by Taylor, 1812.]

and second epitritus, with a pause at the fourth syllable. Analogous to the first of these are the Rathoddhatá and Swágatá, measured by an anapæst preceded by two trochees, and followed in the one by two iambics, and in the other by an ionic. These and the preceding are metres in very common use with the best poets; and instances of them will occur in subsequent extracts, chosen for the sake of other measures with which they are joined.

The several sorts of metre above described are, like the two last, also employed separately: for instance, the first cantos of the Naishadhíya of Śríharsha, and Kirátárjuníya of Bháravi, as well as that of the epic poem of Mágha, are in the iambic measure called Vanśastha; which recurs again in other parts of the same poems: especially in the Kiráta, of which four books out of eighteen are in this measure.

The first of the works just now mentioned is a poem [105] in twenty-two cantos,[1] on the marriage of Nala, king of Nishadha, and Damayantí, daughter of Bhíma, king of Vidarbha. It is a favourite poem on a favourite subject; and though confessedly not free from faults, is by many esteemed the most beautiful composition in the Sanskrit language.[2] The marriage of Nala and Damayantí, his loss of his kingdom by gaming, through the fraudulent devices of Kali disguised in the human form, his desertion of his wife and his transformation, her distresses, her discovery of him, and his restoration to his proper form and to his throne, are related in another poem already noticed under the title of Nalodaya. Their adventures likewise constitute an episode of the Mahábhárata,[3] and are the subject of a novel in prose and verse, by Trivikramabhaṭṭa, entitled Nalachampú[4] or Damayantí-kathá. Śrí-

[1] [The former part was edited with a modern Comm. in Calcutta, 1836, the latter by Dr. Roer in the Bibl. Ind. with the Comm. of Náráyaṇa.]

[2] [There is a śloka current among the Paṇḍits, *Távad bhá Bháraver bháti yávan Mághasya nodayaḥ, Udite Naishadhe kávye kwa Mághaḥ kwa cha Bháraviḥ.*]

[3] From the 53rd to the 79th chapters of the Vana-parva.

[4] A composition, in which prose and verse are intermixed, is called Champú.

harsha's poem, though containing much beautiful poetry according to the Indian taste, is very barren of incident. It brings the story no further than the marriage of Nala and Damayantí, and the description of their mutual affection and happiness, which continues notwithstanding the machinations of Kali. The romantic and interesting adventures subsequent to the marriage, as told in the Nalodaya, are here wholly omitted; while the poet, with a degree of licentiousness, which is but too well accommodated to the taste of his countrymen, indulges in glowing descriptions of sensual love.

The following example of Vanśastha metre is from the introduction of the Naishadhíya. To render the author's meaning intelligible, it may be necessary to premise, that the mere celebrating of Nala and Damayantí is reckoned [106] sufficient to remove the taint of a sinful age, and is so declared in a passage of the Mahábhárata.

Vanśastha metre.

पवित्रमत्रातनुते जगद्युगे
  स्मृता रसक्षालनयेव यत्कथा ।
कथं न सा मद्गिरमाविलामपि
  स्वसेविनीमेव पवित्रयिष्यति ॥

Pavitram atrátanute jagad yuge,
  smritá, rasa-kshálanayeva yat-kathá
Katham na sá mad-giram, ávilám api,
  swasevinim eva, pavitrayishyati.

"How should a story, which being remembered, purifies the world in the present age, as it were by an actual ablution, fail of purifying my voice, however faulty, when employed on this narration." 1. 3.

In the following passage from Bháravi's Kirátárjuniya, the last stanza is an example of the Máliní metre, and the preceding one of the Pushpitágrá; which will be noticed further on:

all the rest are in the Vanśastha measure. It is the close of a reproachful speech of Draupadí to her eldest husband, Yudhishṭhira, inciting him to break the compact with Duryodhana, by which the Páṇḍavas had engaged to remain twelve years in exile.

इमामहं वेद न तावकीं धियं
विचित्ररूपाः खलु चित्तवृत्तयः ।
विचिन्तयन्त्या भवदापदं परां
रुजन्ति चेतः प्रसभं ममाधयः ॥ ३७ ॥

[107] पुराधिरूढः शयनं महाधनं
विबोध्यसे यः स्तुतिगीतिमङ्गलैः ।
अदभ्रदर्भामधिशय्य स स्थलीं
जहासि निद्रामशिवैः शिवारुतैः ॥ ३८ ॥

अनारतं यौ मणिपीठशायिना-
वरञ्जयद्राजशिरःस्रजां रजः ।
निषीदतस्तौ चरणौ वनेषु ते
मृगद्विजालूनशिखेषु बर्हिषाम् ॥ ३९ ॥

पुरोपनीतं नृप रामणीयकं
द्विजातिशेषेण यदेतदन्धसा ।
तदद्य ते वन्यफलाशिनः परं
परैति कार्श्यं यशसा समं वपुः ॥ ४० ॥

द्विषन्निमित्ता यदियं दशा ततः
समूलमुन्मूलयतीव मे मनः ।
परैरपर्यासितवीर्यसंपदां
पराभवोऽप्युत्सवएव मानिनाम् ॥ ४१ ॥

विहाय शान्तिं नृप धाम तत्पुनः
प्रसीद संधेहि वधाय विद्विषाम् ।
व्रजन्ति शत्रूनवधूय निःस्पृहाः
शमेन सिद्धिं मुनयो न भूभृतः ॥ ४२ ॥

[108] पुरःसरा धामवतां यशोधनाः
सुदुःसहं प्राप्य निकारमीदृशम् ।
भवादृशाश्चेदधिकुर्वते परान्
निराश्रया हन्त हता मनस्विता ॥ ४३ ॥
अथ क्षमामेव निरस्तविक्रम-
श्चिराय पर्येषि सुखस्य साधनम् ।
विहाय लक्ष्मीपतिलक्ष्म कार्मुकं
जटाधरः सञ्जुहुधीह पावकम् ॥ ४४ ॥
न समयपरिरक्षणं क्षमं ते
निकृतिपरेषु परेषु भूरिधाम्नः ।
अरिषु हि विजयार्थिनः क्षितीशा
विदधति सोपधि संधिदूषणानि ॥ ४५ ॥
विधिसमयनियोगाद्दीप्तिसंहारजिह्मं
शिथिलवसुमगाधे मग्नमापत्पयोधौ ।
रिपुतिमिरमुदस्योदीयमानं दिनादौ
दिनकृतमिव लक्ष्मीस्त्वां समभ्येतु भूयः ॥ ४६ ॥

"I do not comprehend this thy prudence; for opinions are indeed various: but anguish forces itself on my mind when considering thy extreme distress. Thou, who didst formerly repose on a costly couch, and wert wakened with auspicious praise and song, now sleepest on the ground strewed with pungent grass, and art roused from thy [109] slumbers by the dismal howlings of shakals. Thy feet, which, resting on a footstool adorned with precious stones, were tinged by the dust of the blossoms in the chaplets worn by prostrate monarchs, now tread the wilderness, where the tips of sharp grass are cropped by the teeth of stags.[1] Thy person, O king, which formerly gained beauty by feeding on the blessed remnant of the feast given to holy men, now wastes

[1] [Mallinátha explains *mṛigadwijálúnaśikheshu* "whose tips are cropped by the deer and cut by the ascetics."]

with thy glory, while thou feedest on the fruits of the forest. That thou art reduced to this condition by the act of thy enemies, harrows up my soul. To the valiant, whose courage is unsubdued by the foe, misfortune is a triumph. Relinquishing peace, O king, be active, and rouse thy energy for the slaughter of thy foes. Placid saints, not kings, attain perfection, disarming their enemies by patience. If persons such as thee, whose honour is their wealth, who are leaders of the brave, submit to such insupportable disgrace, then is magnanimity destroyed without resource. If, divested of courage, thou deem submission the means of lasting ease, then quit thy bow, the symbol of a sovereign, and becoming a hermit, feed here with oblations the purifying flame. Adherence to the compact is not good for thee, valiant prince, while thy foes compass thy disgrace; for kings, ambitious of victory, scruple not the use of stratagem in treating with enemies. Thee, who by force of fate and time art now sunk in the deep ocean of calamity, dull with diminished splendour, and slow to enterprise, may fortune again attend, as thou risest like the sun with the new-born day, dispelling hostile gloom." 1. 37-46.

To return to the enumeration of analogous sorts of metre. A true spondaic metre, named Vidyunmálá, consisting of four spondees, with a pause in the middle of the verse, which virtually divides the tetrastich into a stanza of eight, is often mixed, as before observed, with the metre [110] termed Gítyáryá, containing the same quantity in a greater number of syllables.

Other measures, also containing the same quantity but in a greater number of syllables, occur among the species of uniform metre. The subjoined note[1] exhibits several species,

[1] Rukmavatí or Champakamálá, composed of alternate dactyls and spondees; Mattá, measured by three spondees with four short syllables before the last; Paṇava, containing a spondee and dactyl, and an anapæst and spondee; Bhramaravilasita, measured by two spondees, four short syllables and an anapæst: Jaloddhatagati, composed of alternate amphibrachys and anapæsts; and several other species, as Kusumavichitrá, Maṇiguṇanikara, Kuḍmaladantí, Lalaná, etc.

in which the verse is divided by the position of the pauses into two parts equal in quantity, and some of them equal in number of syllables. Further instances are also stated in the notes, of metre containing the same quantity similarly reducible to equal feet.[1] Some of the species of metre which contain a greater number of syllables, are reducible, in conformity to the position of their pauses, to this class.[2]

All these varieties of metre have a great analogy to the Mátrásamaka and other species before described, which similarly contain the quantity of sixteen short syllables or eight long, reducible to four equal feet.

Among the kinds of metre described at the foot of the preceding paragraphs, the Dodhaka, Toṭaka, and Pramitákshará are the most common. A stanza in the anapæstic measure named Pramitákshará, in which each verse exhibits alliteration at its close, has been already quoted [111] from the fifth canto of the Kirátárjuníya of Bháravi. The specimen of anapæstic measure Toṭaka, which will be here cited from the close of the Nalodaya, is a further instance of alliteration introduced into every stanza of this singular poem.

Toṭaka.

अरिसंहतिरस्यवनेषुशुचां
पदमापदमापदमापदमा ।
सुखदंचयथैवजनायहरिं
यतमायतमायतमायतमा ॥

Ari-sanhatir asya vaneshu śuchám
padam ápadam ápad amá 'padamá.
Sukhadan cha yathaiva janáya Harim
yatam áyatamáya tam áyata Má.

1 Dodhaka, composed of three dactyls and a spondee; Toṭaka, containing four anapæsts; Pramitákshará, measured by three anapæsts with an amphibrachys for the second foot; Málá, a species of Chandrávartá, and some others.

2 Thus Mattákríḍá combines two simple kinds, the Vidyunmálá and Chandrávartá. So Kraunchapadá is composed of two species before mentioned, the Champakamálá and Maṇiguṇá.

"The luckless and despondent crowd of his foes found in the forests a calamitous place of sorrow; and prosperity was constant to him, who gave happiness to a sincerely affectionate people, as she clings to Hari, who blesses the guileless." 4. 46.

It has been before said, that in several sorts of metre, the pauses would justify the division of the stanza into a greater number of verses than four, and instances have been shown, where either the number of syllables, or the quantity, would be the same in each verse of a stanza of eight, twelve, or even sixteen short verses. In the following species of metre, the verses of the stanza, subdivided according to the pauses, are unequal.

The Śárdúlavikríḍita, a very common metre, of which examples occur in the former volumes of Asiatic Researches,[1] is a tetrastich, in which the verse consists of [112] nineteen syllables divided by the pause into portions of twelve and seven syllables respectively. The following instance of this metre is from the close of the first book of Mágha's epic poem; where Nárada, having delivered a message from Indra, inciting Kṛishṇa to war with Śiśupála, king of the Chedis, departs, leaving the hero highly incensed against his kinsman and enemy.

ओमित्युक्तवतोऽथ शार्ङ्गिण इति व्याहृत्य वाचं नभ-
स्तस्मिन्नुत्पतिते पुरः सुरमुनाविन्दोः श्रियं बिभ्रति।
शत्रूणामनिशं विनाशपिशुनः क्रुद्धस्य चैद्यं प्रति
व्योम्नीव भ्रुकुटीच्छलेन वदने केतुश्चकारास्पदम्॥

Om ityuktavato 'tha śárngiṇa, iti
vyáhṛitya váchan, nabhas
Tasminn utpatite puraḥ sura-munáv
indoḥ śriyam bibhrati,
Śatrúṇám aniśam vináśa-piśunaḥ,
kruddhasya Chaidyam prati
Vyomnívа, bhrukuṭi-chhalena, vadane
ketuś chakár' áspadam.

[1] Vol. i. p. 279.

"While the divine sage, having delivered this discourse, ascended the sky, bearing on his front the radiance of the moon; the hero, armed with a bow, uttered an expression of assent; and the frown, which found place on his brow wreakful against the prince of the Chedis, was as a portent in the heavens, foretokening destruction of his foes." 1. 75.

The Mandákrántá, which is the metre in which the Meghadúta is composed, has pauses subdividing each verse of seventeen syllables into three portions, containing four, six, and seven syllables respectively: viz. two spondees; two pyrrhichii and an iambic; a cretic, trochee, and spondee. The Hariṇí differs from the preceding in trans[113]posing the first and second portions of the verse, and making the third consist of an anapæst between two iambics. An instance of it will be subsequently exhibited.

The example of the first-mentioned metre, here inserted, is from the Meghadúta.[1] This elegant little poem, attributed as before observed to Kálidása, and comprising no more than 116 stanzas, supposes a Yaksha or attendant of Kuvera to have been separated from a beloved wife by an imprecation of the god Kuvera, who was irritated by the negligence of the attendant, in suffering the celestial garden to be trodden down by Indra's elephant. The distracted demigod, banished from heaven to the earth, where he takes his abode on a hill on which Ráma once sojourned,[2] entreats a passing cloud to convey an affectionate message to his wife.

Mandákrántá metre.

जातं वंशे भुवनविदिते पुष्करावर्तकानां
जानामि त्वां प्रकृतिपुरुषं कामरूपं मघोनः ।
तेनार्थित्वं त्वयि विधिवशाद्दूरबन्धुर्गतोऽहं
याच्ञा मोघा वरमधिगुणे नाधमे लब्धकामा ॥

[1] [Often printed in India; also edited by Gildemeister, and by Wilson with a translation into English verse.]

[2] Called Rámagiri. [It is situated a little to the north of Nagpore.]

संतप्तानां त्वमसि शरणं तत्पयोद प्रियायाः
संदेशं मे हर धनपतिक्रोधविश्लेषितस्य ।
गन्तव्या ते वसतिरलका नाम यक्षेश्वराणां
बाह्योद्यानस्थितहरशिरश्चन्द्रिकाधौतहर्म्या ॥

[114] 6. *Játam vanśe, bhuvana-vidite, pushkarávartakánám,*
Jánámi twám, prakṛiti-purushan, kámarúpam, Maghonaḥ.
Tená 'rthitwan, twayi, vidhi-vaśád dúrabandhur, gato 'ham.
Yáchñá moghá varam adhiguṇe, nádhame labdhakámá.

7. *Santaptánán twam asi śaraṇan; tat, payoda, priyáyáḥ*
Sandeśam me hara, dhanapati-krodha-viśleshitasya.
Gantavyá te vasatir Alaká náma yaksheśwaráṇám,
Váhyodyána-sthita-Hara-śiraś-chandriká-dhauta-harmyá.

"I know thee sprung from the celebrated race of diluvian clouds, a minister of Indra, who dost assume any form at pleasure: to thee I become an humble suitor, being separated by the power of fate from my beloved spouse: a request preferred in vain to the noble is better than successful solicitation to the vile. Thou art the refuge to the inflamed: therefore do thou, O cloud, convey to my beloved a message from me who am banished by the wrath of the god of riches. Thou must repair to Alaká, the abode of the lord of Yakshas, a palace of which the walls are whitened by the moonbeams from the crescent on the head of Śiva, who seems fixed in the grove without." 6 and 7.

The Śikhariṇí, also a common metre, distributes seventeen syllables into portions of six and eleven: an iambic and two spondees in the one, and a tribrachys, anapæst, dactyl, and iambic in the other. This is the metre of the Ánanda-laharí,[1] a hymn of which Śankaráchárya is the reputed author, and which is addressed to Śivá, the Śakti or energy of Śiva or Mahádeva. It comprises a hundred stanzas of orthodox poetry held in great estimation by the devout followers of

[1] [Often printed in India.]

Śankara: the devotional poetry of the Hindus does not usually employ metre of so high an order.

Examples of this measure will be shown in a subsequent [115] extract from a work of a very different kind: a drama, by Bhavabhúti entitled Málatí-mádhava.

The Máliní, consisting of fifteen syllables, places two tribrachys and a spondee in the one subdivided portion of the verse, and a cretic, trochee, and spondee, in the other. An instance of it occurs in a former extract from the Kirátárjuníya. The following example of this metre is from the drama above mentioned. The passage is descriptive of a love-sick maid.

Málini metre.

परिमृदितमृणालीम्लानमङ्गं प्रवृत्तिः
कथमपि परिवारप्रार्थनाभिः क्रियासु ।
कलयति च हिमांशोर्निष्कलङ्कस्य लक्ष्मी-
मभिनवकरिदन्तच्छेदकान्तः कपोलः ॥

Parimṛidita-mṛiṇálí-mlánam angam; pravṛittiḥ
Katham api parivára-prárthanábhiḥ kriyásu.
Kalayati cha himánśor nishkalankasya lakshmím
Abhinava-kari-danta-chchheda-kántaḥ kapolaḥ.

"Her person is weary like bruised threads of a lotus; scarcely can the earnest entreaties of her attendants incite her to any exertion; her cheek, pale as new wrought ivory, emulates the beauty of a spotless moon." 1. 22.

The Praharshiṇí, containing thirteen syllables, separates a molossus from two pyrrhichii, as many trochees, and a spondee. An example of it will be shown in a subsequent extract from Bhavabhúti's drama.

The Ruchirá, with the same number of syllables, disjoins two iambics from two pyrrhichii, a trochee, and cretic. The

opening stanza of the Bhaṭṭikávya[1] may serve as an instance of this metre. The poem bearing that title is on the subject of the adventures of Ráma: it is comprised in [116] twenty-two cantos. Being composed purposely for the practical illustration of grammar, it exhibits a studied variety of diction, in which words anomalously inflected are most frequent. The style, however, is neither obscure nor inelegant; and the poem is reckoned among the classical compositions in the Sanskrit language. The author was Bhartṛihari: not, as might be supposed from the name, the celebrated brother of Vikramáditya; but a grammarian and poet, who was son of Śrídhara Swámí, as we are informed by one of his scholiasts, Vidyávinoda.[2]

Ruchirá metre.

अभून्नृपो विबुधसखः परंतपः
श्रुतान्वितो दशरथ इत्युदाहृतः।
गुणैर्वरं भुवनहितच्छलेन यं
सनातनः पितरमुपागमत्स्वयम् ॥

Abhún nṛipo, vibudha-sakhaḥ, parantapaḥ,
S'rutánwito, Daśaratha ityudáhṛitaḥ,
Guṇair varam, bhuvana-hita-chchhalena, yam
Sanátanaḥ pitaram upágamat swayam.

"He, whom the eternal chose for a father, that he might benefit the world [in a human form], was a king, a friend of the gods, a discomfiter of foes, and versed in science: his name was Daśaratha. He was a prince eminent for his virtues." 1. 1.

[1] [Printed at Calcutta, in 1828, with the commentaries of Jayamangala and Bharatamallika.]

[2] [The same account is given by the scholiast Bharatamallika; but the more usual account is that given by the scholiast Jayamangala, that its author was Bhaṭṭi, the son of S'ri-swámin, who, as the last verse of the poem in some copies states, lived in Vallabhi during the reign of King S'rídharasena, or (as the schol. reads) of Narendra, the son of S'rídhara. Lassen (*Ind. Alt.* iii. 513) places his reign A.D. 530-545.]

The Suvadaná distributes twenty syllables in three portions of the verse: one containing two spondees and a bacchius; the second four short syllables and an anapæst; the third a spondee, pyrrhichius, and iambic. The Sragdhará, a very common metre, differs from it only in the third portion of the verse, which contains a trochee, spondee, and [117] bacchius: but here the number of syllables in every subdivision is equal: *viz.* seven. In all the other instances above described, the subdivisions of the regular verses were unequal.

The following sorts of metre, which are usually employed, have no pauses but at the close of the verse. The Druta-vilambita contains in each verse two anapæsts preceded by three short syllables and a long one, and followed by an iambic. Instances of this measure have been already cited in an extract from the Kirátárjuníya. The Sragviṇí is measured by a trochee, spondee, and iambic repeated; as the Bhujanga-prayáta is by a similar repetition of an iambic, trochee, and spondee. Both sorts of metre are of frequent occurrence in classic poems.

The Vasantatilaka, which consists of a spondee, iambic, tribrachys, dactyl, trochee, and spondee, is one of the metres in most general use. It commonly occurs as a change from other metre. But the whole fifth canto of Mágha's poem is in this measure. The Chaura-pancháśiká, a short poem before described, is in the same metre, and so is a pathetic elegy on the death of a beloved wife which occurs in the Bhámaní-vilása,[1] a collection of miscellaneous poetry by Jagannátha Paṇḍita-rája. It begins thus:

Vasantatilaka.

दैवे पराग्वदनशालिनि हन्त जाते
याते च संप्रति दिवं प्रति बन्धुरत्ने ।

[1] [Printed in Calcutta, 1862. Prof. Aufrecht (*Bodl. Cat.* p. 130) fixes its date in the reign of the Emperor Akbar.]

कस्मै मनः कथयितासि निजामवस्थां
कः शीतलैः शमयिता वचनैस्तवाधिम् ॥

"Since fate, alas! is become adverse, and the gem of kindred is departed towards heaven, to whom, O my soul, [118] wilt thou tell thy grief? and who will appease thy anguish with refreshing words?"

The following passage from some Hindí poem, is quoted in Náráyaṇa Bhaṭṭa's commentary on the Vṛitta-ratnákara as a specimen of this metre in the Kányakubja dialect.

कन्दर्परूप जब तें तुम्ह लीन्ह कृष्ण
लोकोपकाम हम हीं बहुपीर छोरी ।
जौ भेटिकैं विरहपीर नसाउ मेरी
यैं भांति दूति पठई कहि बात गोपी ॥

Kandarpa-rúpa jaba ten tumha línha, Kṛishṇa!
Lokopakáma hama hín, bahu-píra, chhorí.
Jau bheṭikain viraha-píra nasáü merí.
Yain bhánti dúti paṭhäí, kahi báta, Gopí.[1]

"Kṛishṇá, since thou didst assume the form of Cupid, I have neglected worldly affairs, suffering much anxiety. Relieve by thy presence the pain of separation which I endure. Such was the message, with which the Gopí despatched her embassadress."

IV.—*S'loka or Vaktra.*

The most common Sanskrit metre is the stanza of four verses containing eight syllables each, and denominated from the name of the class, Anushṭubh. Several species of it have been described. Two very simple kinds of it occur, consisting of iambic, or trochaic feet exclusively:[2] [119] the rest are

[1] Short vowels, when final, are so faintly sounded, that they are usually omitted in writing the provincial languages of India in Roman character. But they have been here preserved at the close of words; being necessary, as in Sanskrit, for correctly exhibiting the metre.

[2] The first termed Pramáṇí, the other Samání. Considered as a species of

included in one general designation.[1] But several analogous species are comprehended under the denomination of Vaktra. Here the laws of the metre, leaving only the first and eighth syllables indeterminate, require either a bacchius or an amphibrachys[2] before the eighth syllable, and forbid an anapæst or tribrachys after the first; as also in the second and fourth verses of the stanza, an amphimacer. A variety of this metre introduces a tribrachys before the eighth syllable in the first and third verses, and a bacchius in the second and fourth.[3] And another sort,[4] which admits five varieties, requires the penultimate syllable to be short in the second and fourth verses; and introduces before the eighth syllable of the first and third verses, a dactyl, anapæst, tribrachys, amphimacer, or molossus.

The metre which is most in use, is one of the species now described, in which the number of syllables is determinate (*viz.* eight), but the quantity variable. Kálidása appropriates to this metre the term Śloka (abbreviated from Anushṭubh Śloka); and directs, that the fifth syllable of each verse be short, the sixth long, and the seventh alternately long and short. The mythological poems under the title of Puráṇa, and the metrical treatises on law and other sciences, are almost entirely composed in this easy verse; with a sparing intermixture of other analogous sorts, and with the still rarer introduction of other kinds of metre. [120] The varieties of the Anushṭubh Śloka which most frequently occur, make the fifth, sixth, and seventh syllables of the first and third verse all long or all short; or else the fifth long with the sixth and seventh short. Thus varied, it is much used by the best

uniform metre, the first is also named Nagaswarúpiṇí or Matallikà, and the second is denominated Mallikà. There is also a regular measure which alternates trochees and iambics, and is denominated Máṇavakákríḍá: and another, named Chitrapadá, consisting of two dactyls and a spondee.

[1] Vitána.

[2] The metre is named Pathyá when an amphibrachys is introduced in the second and fourth verses; some say in the first and third.

[3] Chapalá. [4] Vipulá.

poets. Kálidása has employed it in the second and sixth cantos of his poem entitled Kumára-sambhava, and in the first, fourth, and several others of the Raghuvanśa. The second and nineteenth cantos of Mágha's poem are in this metre, and so is the eleventh of the Kirátárjuníya.

The examples here subjoined are from Mágha's poem. One passage is part of a speech of Balaráma to Kṛishṇa, urging him to the immediate commencement of hostilities against Śiśupála: the other is extracted from Uddhava's reply, dissuading Kṛishṇa from instant war, and advising his previous compliance with Yudhishṭhira's invitation to assist at a solemn sacrifice which the king was on the point of celebrating at Indraprastha.

सखा गरीयाञ्छत्रुश्च कृत्रिमस्तौ हि कार्यतः ।
स्यातामभित्रौ मित्रे च सहजप्राकृतावपि ॥ ३६ ॥
उपकर्त्रारिणा संधिर्न मित्रेणापकारिणा ।
उपकारापकारौ हि लक्ष्यं लक्षणमेतयोः ॥ ३७ ॥
त्वया विप्रकृतश्चैद्यो रुक्मिणीं हरता हरे ।
बद्धमूलस्य मूलं हि महद्वैरतरोः स्त्रियः ॥ ३८ ॥
त्वयि भौमं गते जेतुमरौत्सीत्स पुरीमिमाम् ।
प्रोषितार्यमणं मेरोरन्धकारस्तटीमिव ॥ ३९ ॥
आलप्यालमिदं बभ्रोर्यत्स दारानपाहरत् ।
[121] कथापि खलु पापानामलमश्रेयसे यतः ॥ ४० ॥
विराद्धएवं भवता विराद्धा बहुधा च नः ।
निर्वर्त्ततेऽरिः क्रियया सः श्रुतश्रवसः सुतः ॥ ४१ ॥
विधाय वैरं सामर्षे नरोऽरौ य उदासते ।
प्रक्षिप्योदर्चिषं कक्षे शेरते तेऽभिमारुतम् ॥ ४२ ॥
मनागनभ्यावृत्त्या वा कामं क्षाम्यतु यः क्षमी ।
क्रियासमभिहारेण विराध्यन्तं क्षमेत कः ॥ ४३ ॥
अन्यदा भूषणं पुंसः क्षमा लज्जेव योषितः ।
पराक्रमः परिभवे वैयात्यं सुरतेष्विव ॥ ४४ ॥

मा जीवन्यः परावज्ञादुःखदग्धोऽपि जीवति ।
तस्याजननिरेवास्तु जननीक्लेशकारिणः ॥ ४५ ॥
पादाहतं यदुत्थाय मूर्धानमधिरोहति ।
स्वस्थादेवापमानेऽपि देहिनस्तद्वरं रजः ॥ ४६ ॥

Balaráma speaks. "A proved enemy, and a tried friend, are most to be regarded; for they are known by their actions: others, presumed to be so, from temper or affinity, may be found in the end to be friend or foe. Peace may be maintained with a natural enemy, who confers benefits; not with a presumptive friend, who commits outrages; kindness or injury, is the proper test of both. The king of the Chedis was offended, O Hari, by the seizure of Rukmiṇí; for woman is the chief cause, that the tree of discord takes root. Whilst thou wert engaged in subduing the offspring of the earth, he besieged this city, as darkness encircles the skirts of Meru while the sun is remote. To hint, that he ravished [122] the wife of Vabhru is enough: the narration of crimes is too disgustful. Thus aggrieved by thee, and having much injured us, the son of Śrutaśravas is an enemy demonstrated by deeds. The man who is negligent, while an enraged foe meditates aggressions, sleeps in the wind with fire under his arm. What forbearing man, who would cheerfully dissemble a slight and single injury, can patiently endure repeated wrongs? At other times, patience becomes a man; and pudency, a woman: but valour befits the insulted warrior; as modesty should be laid aside by a woman in the nuptial bed. Whoever lives (may none so live!) tortured by the pain of insults from his enemy, would that he had never been born, vainly giving his mother anguish. Dust, which, kicked by the foot of the traveller, rises and settles on his head, is less contemptible than the dastard, who is contented under wrongs." 2. 36—46.

Uddhava, in reply, addressed to Kṛishṇa:

संभाव्य त्वामतिभरक्षमस्कन्धं सबान्धवः ।
सहायमध्वरधुरां धर्मराजो विवक्षते ॥ १०३ ॥

महात्मानोऽनुगृह्णन्ति भजमानान्रिपूनपि ।
सपत्नीः प्रापयन्त्यब्धिं सिन्धवो नगनिम्नगाः ॥ १०४ ॥
चिरादपि बलात्कारो बलिनः सिद्धयेऽरिषु ।
छन्दानुवृत्तिदुःसाध्याः सुहृदो विमनीकृताः ॥ १०५ ॥
मन्यसेऽरिवधः श्रेयान्प्रीतये नाकिनामिति ।
पुरोडाशभुजामिष्टमिष्टं कर्तुमलंतराम् ॥ १०६ ॥
अमृतं नाम यत्सन्तो मन्त्रजिह्वेषु जुह्वति ।
शोभैव मन्दरक्षुब्धक्षुभिताम्भोधिवर्णना ॥ १०७ ॥
[123] सहिष्ये शतमागांसि सूनोस्त इति यत्त्वया ।
प्रतीक्ष्यं तत्प्रतीक्ष्यायै पितृष्वस्रे प्रतिश्रुतम् ॥ १०८ ॥
तीक्ष्णा नारुंतुदा बुद्धिः कर्म शान्तं प्रतापवत् ।
नोपतापि मनः सोष्म वागेका वाग्मिनः सतः ॥ १०९ ॥
स्वयंकृतप्रसादस्य तस्याह्नो भानुमानिव ।
समयावधिमप्राप्य नान्तायालं भवानपि ॥ ११० ॥

"The just king and his kinsmen, relying on thee for an associate capable of sustaining the heaviest burden, are willing to undertake the task of a solemn sacrifice. Even to enemies, who court them, the magnanimous show kindness; as rivers convey to the ocean the rival torrents from the mountains. Violence, used against foes by the strong, is at length successful; but friends, once offended, are not easily reconciled even by compliances. Thou thinkest, that the slaughter of the foe will most gratify the inhabitants of heaven; but far better is it to present offerings, which are desired by the deities who devour oblations. What the virtuous offer, under the name of ambrosia, in flames, whose tongues are holy prayers, was the splendid ornament of the ocean churned by the mountain Mandara.[1] The promise made by thee to thy father's venerable sister, to forgive her son a hundred offences, should be strictly observed. Let the intellect of a good man be sharp without wounding; let his actions be vigorous, but concili-

[1] [Rather 'prayers are the amṛita,—the churned ocean is rhetoric.']

atory; let his mind be warm, without inflaming: and let his word, when he speaks, be rigidly maintained. Before the appointed hour, even thou art not able to destroy the tyrant, on whom thyself conferred that boon; no more than the sun can prematurely close the day, which he himself enlightens." 2. 103—110.

[124] V.—*Compound metre.*

Instances of compound metre have been already exhibited under the designation of Upajáti, consisting of two kinds of simple metre variously combined: two of these combinations are repeated under the head of half equal metre, with the contrasted metre of Ákhyánakí and Viparítákhyánakí. Other species of metre belonging to this class are in use among eminent poets: particularly the Pushpitágrá and Aparavaktrá.[1] In the first, both verses are terminated by two trochees and a spondee, and begin with four short syllables, one verse interposing a pyrrhichius, and the other a dactyl. In the next species, both verses are terminated by three iambics, and begin like the preceding with four short syllables; but one verse interposes a single short syllable, and the other a trochee.

Examples of the first of these mixed measures are very common. One instance has been already exhibited in a quotation from the first canto of Bháravi's poem of Arjuna and the mountaineer. The whole tenth canto of the same poem, and the seventh of Mágha's death of Śiśupála, are in this mixt metre. The second is less common: but an instance occurs in the eighteenth canto of the Kirátárjuníya.

The close of the ninth canto of Kálidása's Raghuvanśa, exhibiting a variety of metre, in which two of the species now mentioned are included, is here cited, for the sake of these and other species which have been before described. The subject is Daśaratha's hunt, in which he slew the hermit's son: a story well known to the readers of the Rámáyaṇa.

[1] [Apavaktra appears to be the more correct form.]

इति विस्मृतान्यकरणीयमात्मनः
सचिवावलम्बितधुरं नराधिपम् ।
[125] परिवृद्धरागमनुबन्धसेवया
मृगया जहार चतुरेव कामिनी ॥ ७४ ॥
सुललितकुसुमप्रवालशय्यां
ज्वलितमहौषधिदीपिकासनाथाम् ।
नरपतिरतिवाहयांबभूव
क्वचिदसमेतपरिच्छदस्त्रियामाम् ॥ ७५ ॥
उषसि स गजयूथकर्णतालैः
पटुपटहध्वनिभिर्विनीतनिद्रः ।
अरमत मधुरस्वराणि शृण्वन्
विहगविकूजितवन्दिमङ्गलानि ॥ ७६ ॥
अथ जातु रुरोर्गृहीतवर्त्मा
विपिने पार्श्वचरैरलक्ष्यमाणः ।
श्रमफेनमुचा तपस्विगाढां
तमसां प्राप नदीं तुरंगमेण ॥ ७७ ॥
कुम्भपूरणभवः पटुरुच्चै-
रुच्चचार निनदोऽम्भसि तस्याः ।
तत्र स द्विरदबृंहितशङ्की
शब्दपातिनमिषुं विससर्ज ॥ ७८ ॥
नृपतेः प्रतिषिद्धमेव तत्
कृतवान्पङ्क्तिरथो विलङ्घ्य यत् ।
[126] अपथे पदमर्पयन्ति हि
श्रुतवन्तोऽपि रजोनिमीलिताः ॥ ७९ ॥
हा तातेति क्रन्दितमाकर्ण्य विषण्ण-
स्तस्यान्विष्यन्वेतसगूढं प्रभवं सः ।
शल्यप्रोतं प्रेक्ष्य सकुम्भं मुनिपुत्रं
तापादन्तःशल्यइवासीत्क्षितिपोऽपि ॥ ८० ॥

तेनावतीर्य तुरगात्प्रथितान्वयेन
  पृष्टान्वयः स जलकुम्भनिषण्णदेहः।
तस्मै द्विजेतरतपस्विसुतं स्खलद्भि-
  रात्मानमक्षरपदैः कथयांबभूव ॥ ८१ ॥
तच्चोदितश्च तमनुद्धृतशल्यमेव
  पित्रोः सकाशमवसन्नदृशोर्निनाय।
ताभ्यां तथागतमुपेत्य तमेकपुत्र-
  मज्ञानतः स्वचरितं नृपतिः शशंस ॥ ८२ ॥
तौ दम्पती बहु विलप्य शिशोः प्रहर्त्रा
  शल्यं निखातमुदहारयतामुरस्तः।
सोऽभूत्परासुरथ भूमिपतिं शशाप
  हस्तार्पितैर्नयनवारिभिरेव वृद्धः ॥ ८३ ॥
दिष्टान्तमाप्स्यति भवानपि पुत्रशोका-
  दन्त्ये वयस्यहमिवेति तमुक्तवन्तम्।
[127] आक्रान्तपूर्वमिव मुक्तविषं भुजङ्गं
  प्रोवाच कोशलपतिः प्रथमापराद्धः ॥ ८४ ॥
शापोऽप्यदृष्टतनयाननपद्मशोभे
  सानुग्रहो भगवता मयि पातितोऽयम्।
कृष्यां दहन्नपि खलु क्षितिमिन्धनेद्धो
  बीजप्ररोहजननीं ज्वलनः करोति ॥ ८५ ॥
इत्थंगते गतघृणः किमयं विधत्तां
  वध्यस्तवेत्यभिहिते वसुधाधिपेन।
एधान्हुताशनवतः स मुनिर्ययाचे
  पुत्रं परासुमनुगन्तुमनाः सदारः ॥ ८६ ॥
प्राप्तानुगः सपदि शासनमस्य राजा
  सम्पाद्य पातकविलुप्तधृतिर्निवृत्तः।
स्वान्तर्निविष्टपदमात्मविनाशहेतुं
  शापं दधज्ज्वलनमौर्वमिवाम्बुराशिः ॥ ८७ ॥

तदित्थमर्थश्च मति गतत्रपः
विमेष ते मध्यजनोऽनुतिष्ठतु ।
स वह्निसंस्कारमयाचतात्मनः
सदारसूनोर्विदधे च तं नृपः ॥ ८८ ॥
समीयिवान्नृपवृषभोऽथ सैनिकैः
स्वमन्दिरं शिथिलधृतिर्व्यवर्तत ।
[128] मनोगतं गुरुमृषिशापमुद्वहन्
वडवानलं जलधिरिवान्तराश्रयम् ॥ ८९ ॥

"Thus did the chase, like an artful mistress, allure the king, forgetful of all other business, and leaving to his ministers the burthen of the state, while his passion grew by indulgence.

"The king, without his retinue, passed the night in some sequestered spot, reposing on a bed of leaves and blossoms, and enlightened by the flame of wild herbs. At dawn, being awakened by the flapping of his elephant's ears in place of the royal drums, he delighted in listening to the sweet and auspicious tones of chirping birds.

"One day, pursuing an antelope, and outstripping his attendants, he arrived, with his horse foaming with fatigue, on the banks of the Tamasá, a stream frequented by the devout. In its waters a deep sound, caused by the filling of a vase, was mistaken by the king for the grumbling of an elephant, and he directed an arrow towards the spot whence the sound proceeded. By this forbidden act[1] Daśaratha transgressed: for even the wise, when blinded by passion, deviate into the pathless waste. 'Ah father!' was the piteous cry which issued: and the king, anxious, sought its cause among the reeds. He found the vase, and near it a hermit's son pierced by his arrow, and he stood amazed as if internally wounded. The king, of glorious lineage, who had already alighted from his horse, eagerly inquired the parentage of the youth; who,

[1] The royal and military tribe is prohibited from killing elephants unless in battle.

resting on the vase, with feeble accents said 'he was the son of a hermit, but no priest.' Instructed by him, the king conveyed the wounded youth to his blind parents: and to them, as they approached [129] their only son, he related his mistaken deed. The unhappy pair, lamenting, conjured the king to draw the arrow from the breast of their wounded son. The youth was dead. The aged hermit, ratifying his curse with tears instead of water for a libation, pronounced this imprecation on the king: 'In thy extreme age thou shalt reach thy fated time, with grief like mine for a beloved son.' While he spoke, as it were a serpent assailing first and then discharging fatal venom,[1] Kauśalya's lord,[2] conscious of the first offence, addressed him thus: 'Thy curse has fallen like a boon on me, who have not seen the beauteous countenance of offspring; as fire, fed with fuel, fertilizes the soil which it burns.' The king then said, 'For me, who merciless deserve death at thy hands, what are thy commands?' The holy hermit asked fuel for the funeral pile; he and his wife resolving to follow their son in death. The king, whose attendants were now arrived, promptly fulfilled his command, and remained dejected, bearing with him the hermit's curse, a cause of his future destruction, as the ocean embraces the devouring fire. Again the king addressed him. 'Wise hermit! what shall this shameless criminal, who deserves death from thee, now perform?' He desired the funeral flame to be duly lighted: and the king presented the fire for him, and his wife and son.

"The chief of the race of Raghu, attended by his army, now returned to his palace, dejected, bearing in his mind the heavy imprecation of the saint, as the ocean holds within itself the fire of destruction." 9. 74—89.[3]

This extract exhibits, besides two stanzas of Pushpitágrá[4]

[1] [Mallinátha explains it, "like a serpent discharging his venom, having been first attacked (sc. by being trodden on)."] [2] [Rather "the lord of Kośala."]

[3] [9. 69–82 in the Calcutta and Stenzler's edition. Neither has the two last verses, which seem evidently interpolated.] [4] 75 and 76.

and as many of Sundarí metre,[1] both belonging to the present head, and one, of which an example was promised [130] in this place,[2] several others which have been before exemplified,[3] and two which are less common.[4]

A singular species of variable metre is mentioned by writers on prosody, who describe it as a stanza in which the verses increase in arithmetical progression. In the instance exhibited by them the four verses of the stanza increase regularly from eight to twenty syllables. Varieties of it are noticed in which the progression is not regular, the short verse exchanging places with the second, third, or fourth. The quantity of the syllables is in general indeterminate; but varieties are stated in which the verse consists of short syllables, either ending or beginning with a spondee, or both ending and beginning with spondees.

A class of metre which admits an inordinate length of the verse, is known under the general designation of Daṇḍaka. The verse may consist of any number of syllables, from twenty-seven to nine hundred and ninety-nine; and the specific name varies accordingly.[5] The construction of the metre requires that the first six syllables be short, and the remainder of the verse be composed of cretic feet; or, instead of the cretic foot, the bacchius. These two kinds of metre are distinguished by different names. A verse consisting of any number of anapæsts within the limitation above mentioned, is also comprehended under this general designation; as are verses of similar length consisting exclusively of iambic or trochaic feet. They have their peculiar denominations.

Examples of these extravagantly long verses are to be [131] found in the works of the poet Váṇa. It is unnecessary to

[1] 77 and 79, most properly the last.
[2] Swágatá 78.
[3] Vasantatilaka 81—87 and Upendravajra 88. Ruchirá 89.
[4] Manjubháshiṇí 74 (P. T. D. 3 I.) and Mattamayúra 80 (2 S+T. I. D. S.)
[5] For example, *Arṇa* which comprises ten feet; *Arṇava* eleven; *Vyála* twelve; *Jímúta* nineteen, etc.

insert any specimen of them in this place, as an example will occur in a subsequent quotation from Bhavabhúti's drama.

That class of metre, which is termed half equal, because the alternate verses are alike, comprises various sorts, which appear to be compounded of two simple kinds with an appropriate number of syllables of a determinate quantity.

Another class, in which every verse of the stanza is different, appears more complex. But, here also, the quantity as well as the number of syllables being regulated, the stanza is in fact composed of four kinds of uniform metre.

The most common metre of this class is that called Udgatá. Here the number of syllables in each verse, as well as their quantity, differs; the first verse comprising an anapæst, iambic, tribrachys, and trochee; the second, a tribrachys and anapæst with two iambics; the third, a trochee, tribrachys, and two anapæsts;[1] and the fourth, an anapæst, iambic, and pyrrhichius with three iambics.

The twelfth canto of the Kirátárjuníya is in this metre; and so is the fifteenth canto of Mágha's epic poem. It begins thus:

अथ तत्र पाण्डुतनयेन सदसि विहितं मधुद्विषः ।
मानमसहत न चेदिपतिः परवृद्धिमत्सरि मनो हि मानिनाम् ॥

"But the king of the Chedis was impatient of the honours which the son of Páṇḍu commanded to be shown in that assembly to the foe of Madhu; for the mind of the proud is envious of the prosperity of others."

[132] Other kinds of metre, in which every verse of the stanza differs in the number and quantity of syllables, are comprehended under the general name of Gáthá; under which also some writers on prosody[2] include any sort of metre not described by Pingala, or not distinguished by a specific appel-

[1] Or the third verse may consist of a trochee and dactyl, with two anapæsts; or of two trochees, with two anapæsts; and the metre is denominated, in the first instance, *Saurabhaka*; in the second, *Lalitá*.

[2] Haláyudha and Náráyaṇa-tára.

lation. The same denomination is applicable also to stanzas consisting of any number of verses other than four.[1] An instance of a stanza of six verses has been remarked in the Mahábhárata, and another example occurs at the beginning of Mágha's poem.[2]

द्विधाकृतात्मा किमयं दिवाकरो
विधूमरोचिः किमयं हुताशनः ।
गतं तिरश्चीनमनूरुसारथेः
प्रसिद्धमूर्ध्वज्वलनं हविर्भुजः ।
पतत्यधो धामविसारि सर्वतः
किमेतदित्याकुलमीक्षितं जनैः ॥

Dwidhá-kritátmá, kim ayam divákaro?
Vidhúma-rochih, kim ayam hutásanah?
Gatan tiraśchínam anúru-sáratheh.
Prasiddham úrdhwajwalanam havirbhujah.
Patatyadho dháma-visári sarvatah
Kim etad? ityákulam íkshitam janaih.

[133] Nárada descending from the heavens to visit Krishna, is thus described:

"'Is this the sun self-parted into two orbs? Is it fire shining with light divested of smoke? The motion of the luminary whose charioteer has no legs, is distinguished by its curvature; the ascent of flame is a known property of fire. Then what is this, which descends diffusing light around?' Thus was the sight contemplated with wonder by the people." *Mágha* 1. 2.

[1] Divákara on the Vritta-ratnákara.

[2] It is cited by Divákara Bhatta as an instance of a stanza of six. Yet the scholiasts of the poem omit the two first verses and read the stanza as a tetrastich. One commentator, however, does remark, that copies of the poem exhibit the additional verses; and another commentator has joined them with two more verses in a separate stanza.

VI.—*Prose; and Verse mixed with Prose.*

I follow the example of Sanskrit writers on prosody, in proceeding to notice the different species of prose. They discriminate three, and even four sorts, under distinct names. 1st. Simple prose, admitting no compound terms. It is denominated Muktaka. This is little used in polished compositions; unless in the familiar dialogue of dramas. It must undoubtedly have been the colloquial style at the period when Sanskrit was a spoken language. 2nd. Prose, in which compound terms are sparingly admitted. It is called Kulaka. This and the preceding sort are by some considered as varieties of a single species named Chúrṇiká. It is of course a common style of composition; and when polished, is the most elegant as it is the chastest. But it does not command the admiration of Hindu readers. 3rd. Prose, abounding in compound words. It bears the appellation of Utkaliká-práya. Examples of it exhibit compounds of the most inordinate length: and a single word exceeding a hundred syllables is not unprecedented. This extravagant style of composition, being suitable to the taste of the Indian learned, is common in the most elaborate works of their favourite authors. 4th. Prose, modulated so as frequently to exhibit portions of verse. It is named Vṛittagandhi. It will occur without study, and even [134] against design, in elevated compositions, and may be expected in the works of the best writers.

Some of the most elegant and highly wrought works in prose are reckoned among poems, as already intimated, in like manner as the "Télémaque" of Fénélon and "Tod Abels" of Gessner. The most celebrated are the Vásavadattá of Subandhu, the Daśa-kumára of Daṇḍí, and the Kádambarí of Váṇa.[1]

[1] [In p. 89 Colebrooke spells the name Báṇa. Dr. Hall, in the preface to his edition of the Vásavadattá, has shown that Báṇa lived at the Court of Harshavardhana, King of Kanauj, whose history is partly given by the Chinese traveller Hiouen Thsang. He died A.D. 650. Some of the facts given by

The first of these is a short romance, of which the story is simply this.[1] Kandarpaketu, a young and valiant prince, son of Chintámaṇi king of Kusumapura,[2] saw in a dream a beautiful maiden, of whom he became desperately enamoured. Impressed with the belief, that a person, such as seen by him in his dream, had a real existence, he resolves to travel in search of her, and departs, attended only by his confidant Makaranda. While reposing under a tree in a forest at the foot of the Vindhya mountains, where they halted, Makaranda overhears two birds conversing, and from their discourse he learns that the princess Vásavadattá, having rejected all the suitors who had been assembled by the king her father for her to make choice of a husband, had seen Kandarpaketu in a dream, in which she had even dreamt his name. Her confidant, Tamáliká, sent by her in search of the prince, was arrived in the same forest, and is discovered there by Makaranda. She delivers to the prince a letter from the princess, and conducts him to the king's palace. He obtains from the princess the avowal of her love; and her confidant, Kalávatí, reveals to the prince the violence of her passion.

The lovers depart together: but, passing through the [135] forest, he loses her in the night. After long and unsuccessful search, in the course of which he reaches the shore of the sea, the prince, grown desperate through grief, resolves on death. But at the moment when he was about to cast himself into the sea, he hears a voice from heaven, which promises to him the recovery of his mistress, and indicates the means. After some time, Kandarpaketu finds a marble statue, the precise resemblance of Vásavadattá. It proves to be her; and she

Hiouen Thsang have been illustrated by Dr. Hall, from the Harsha-charitra, which Báṇa wrote to celebrate his patron's achievements. The poet mentions the 'Vásavadattá' in his introduction, as also the Vṛihatkathá. (Cf. also B. A. S. Journ. 1862, pp. 1-13).]

[1] [For a fuller account of the plot, see Dr. Hall's introduction to his edition in the Bibliotheca Indica.]

[2] Same with Páṭalípura or Páṭaliputra; the ancient Palibothra, now Patna. As. Res., vol. iv., p. 11. [Kusumapura was the city of the heroine's father.]

quits her marble form and regains animation. She recounts the circumstances under which she was transformed into stone.

Having thus fortunately recovered his beloved princess, the prince proceeds to his city, where they pass many years in uninterrupted happiness.

This story, told in elegant language, and intermixed with many flowery descriptions in a poetical style, is the Vásavadattá of Subandhu. There is an allusion, however, in Bhavabhúti's drama,[1] to another tale, of Vásavadattá's having been promised by her father to the king Sanjaya, and giving herself in marriage to Udayana. I am unable to reconcile this contradiction otherwise than by admitting an identity of name and difference of story. But no other trace has been yet found[2] of the story to which Bhavabhúti has alluded.

In the work above described, as in various compositions of the same kind, the occasional introduction of a stanza, or even several, either in the preface or in the body of the work, does not take them out of the class of prose. But other works exist, in which more frequent introduction of verse makes of these a class apart. It bears the name of Champú: and of this kind is the Nala-champú of Trivikrama before mentioned. This style of composition is not [136] without example in European literature. The "Voyage de Bachaumont et de la Chapelle," which is the most known, if not the first instance of it in French, has found imitators in that and in other languages. The Sanskrit inventor of it has been equally fortunate; and a numerous list may be collected of works expressly entitled Champú.[3]

The Indian dramas are also instances of the mixture of prose and verse; and, as already mentioned, they likewise intermixed a variety of dialects. Our own language exhibits

[1] Málatí Mádhava. Act 2nd. ["Vásavadattá gave herself to Udayana, although she had been bestowed by her father on King Sanjaya."]

[2] [The version given in the Kathásaritságara does not agree with Bhavabhúti's allusion.]

[3] As the Nṛisinha-champú, Gangá-champú, Vṛindávana-champú, etc.

too many instances of the first to render it necessary to cite any example in explanation of the transition from verse to prose. In regard to mixture of languages, the Italian theatre presents instances quite parallel in the comedies of Angelo Beolco surnamed Ruzanti:[1] with this difference, however, that the dramas of Ruzanti and his imitators are rustic farces, while the Indian dramatists intermingle various dialects in their serious compositions.

Notwithstanding this defect, which may indeed be easily removed by reading the Prákrit speeches in a Sanskrit version, the theatre of the Hindus is the most pleasing part of their polite literature, and the best suited to the European taste.[2] The reason probably is, that authors are restrained more within the bounds of poetic probability when composing for exhibition before an audience, than in writing for private perusal or even for public recital.

The S'akuntalá by Kálidása, which certainly is no unfavourable specimen of the Indian theatre, will sufficiently justify what has been here asserted. I shall conclude this essay with a short extract from Bhavabhúti's[3] unrivalled drama entitled Málatí-mádhava; prefixing a concise argument of the play, the fable of which is of pure invention.

[137] 'Bhúrivasu, minister of the king of Padmávatí, and Devaráta in the service of the king of Vidarbha, had agreed, when their children were yet infants, to cement a long subsisting friendship, by the intermarriage of Málatí, daughter of the first, with Mádhava, son of the latter. The king having indicated an intention to propose a match between Bhúrivasu's daughter and his own favourite Nandana, who was both old and ugly, the minister is apprehensive of giving offence to the king by refusing the match; and the two friends concert a

[1] Walker's Memoir on Italian Tragedy.

[2] [See Prof. Wilson's *Select Specimens of the Hindu Theatre*, with the introductory treatise on their dramatic system.]

[3] [Bhavabhúti flourished at the court of Yas'ovarman, who reigned at Kanauj about A.D. 720.]

plan with an old priestess, who has their confidence, to throw the young people in each other's way, and to connive at a stolen marriage. In pursuance of this scheme, Mádhava is sent to finish his studies at the city of Padmávatí, under the care of the old priestess Kámandakí. By her contrivance, and with the aid of Málatí's foster sister Lavangiká, the young people meet and become mutually enamoured. It is at this period of the story, immediately after their first interview, that the play opens. The first scene, which is between the old priestess and her female pupil Avalokitá, in a very natural manner introduces an intimation of the previous events, and prepares the appearance of other characters, and particularly a former pupil of the same priestess named Saudáminí, who has now arrived at supernatural power by religious austerities; a circumstance which her successor Avalokitá has learnt from Kapálakuṇḍalá, the female pupil of a tremendous magician, Aghoraghaṇṭa, who frequents the temple of the dreadful goddess near the cemetery of the city.

'The business of the play commences; and Mádhava, his companion Makaranda, and servant Kalahansa, appear upon the scene. Mádhava relates the circumstances of the interview with Málatí, and acknowledges himself deeply smitten. His attendant produces a picture [138] which Málatí had drawn of Mádhava, and which had come into his hands from one of her female attendants. In return Mádhava delineates the likeness of Málatí on the same tablet, and writes under it an impassioned stanza. It is restored; and being in the sequel brought back to Málatí, their mutual passion, encouraged by their respective confidants, is naturally increased. This incident furnishes matter for several scenes. Meantime, the king had made the long-expected demand; and the minister has returned an answer that "the king may dispose of his daughter as he pleases." The intelligence reaching the lovers throws them into despair. Another interview in a public garden takes place by the contrivance of Kámandakí. At

this moment a cry of terror announces that a tremendous tiger has issued from the temple of Śiva: an instant after, Nandana's youthful sister, Madayantiká, is reported to be in imminent danger. Then Mádhava's companion, Makaranda, is seen rushing to her rescue. He has killed the tiger. He is himself wounded. This passes behind the scenes. Madayantiká, saved by the valour of Makaranda, appears on the stage. The gallant youth is brought in insensible. By the care of the women he revives: and Madayantiká, of course, falls in love with her deliverer. The preparations for Málatí's wedding with Nandana are announced. The women are called away. Mádhava in despair resolves to sell his living flesh for food to the ghosts and malignant spirits, as his only resource to purchase the accomplishment of his wish. He accordingly goes at night to the cemetery. Previous to his appearance there, Kapálakuṇḍalá, in a short soliloquy, has hinted the magician's design of offering a human sacrifice at the shrine of the dreadful goddess, and selecting a beautiful woman for the victim. Mádhava appears as a vendor of human flesh; offering, but in vain, [139] to the ghosts and demons the flesh off his limbs as the purchase of the accomplishment of his wish. He hears a cry of distress and thinks he recognizes the voice of Málatí. The scene opens, and she is discovered dressed as a victim, and the magician and sorceress preparing for the sacrifice. They proceed to their dreadful preparatives. Mádhava rushes forward to her rescue: she flies to his arms. Voices are heard as of persons in search of Málatí. Mádhava, placing her in safety, encounters the magician. They quit the stage fighting. The event of the combat is announced by the sorceress, who vows vengeance against Mádhava for slaying the magician, her preceptor.'

The fable of the play would have been perhaps more judiciously arranged if this very theatrical situation had been introduced nearer to the close of the drama. Bhavabhúti has placed it so early as the fifth act. The remaining five (for the play is in ten acts) have less interest.

'Málatí, who had been stolen by the magician, while asleep, being now restored to her friends, the preparations for her wedding with Nandana are continued. By contrivance of the old priestess, who advised that she should put on her wedding dress at a particular temple, Makaranda assumes that dress, and is carried in procession, in place of Málatí, to the house of Nandana. Disgusted with the masculine appearance of the pretended bride, and offended by the rude reception given to him, Nandana, to have no further communication with his bride, vows and consigns her to his sister's care. This, of course, produces an interview between the lovers, in which Makaranda discovers himself to his mistress, and she consents to accompany him to the place of Málatí's concealment. The friends accordingly assemble at the [140] garden of the temple: but the sorceress, Kapálakuṇḍalá, watches an opportunity when Málatí is unprotected, and carries her off in a flying car. The distress of her lover and friends is well depicted: and, when reduced to despair, being hopeless of recovering her, they are happily relieved by the arrival of Saudáminí, the former pupil of the priestess. She has rescued Málatí from the hands of the sorceress, and now restores her to her despairing lover. The play concludes with a double wedding.'

From this sketch of the story it will be readily perceived, that the subject is not ill suited to the stage: and making allowance for the belief of the Hindus in magic and supernatural powers, attainable by worship of evil beings as well as of beneficent deities, the story would not even carry the appearance of improbability to an Indian audience. Setting aside this consideration, it is certainly conducted with art; and notwithstanding some defects in the fable, the interest upon the whole is not ill preserved. The incidents are striking; the intrigue well managed. As to the style, it is of the highest order of Sanskrit composition; and the poetry, according to the Indian taste, is beautiful.

I shall now close this essay with the promised extract from

the play here described. It contains an example, among other kinds of metre, of the Daṇḍaka or long stanza, and is selected more on this account than as a fair specimen of the drama. This disadvantage attends all the quotations of the present essay. To which another may be added: that of a prose translation, which never conveys a just notion of the original verse.

[141] *Extract from Málati-mádhava. Act 5.*

Mádhava continues to wander in the cemetery.

"Human flesh to be sold: unwounded, real flesh from the members of a man. Take it. Take it."[1]

'How rapidly the Paiśáchas flee, quitting their terrific forms. Alas! the weakness of these beings.'

He walks about.

'The road of this cemetery is involved in darkness. Here is before me "the river that bounds it; and tremendous is the roaring of the stream, breaking away the bank, while its waters are embarrassed among the fragments of skulls, and its shores resound horribly with the howling of shakals and the cry of owls screeching amidst the contiguous woods."[2]

Behind the scenes.

'Ah! unpitying father, the person whom thou wouldst make the instrument of conciliating the king's mind, now perishes.'

MÁDH., *listening with anxiety.*] "I hear a sound [142]

[1] Anushṭubh.

अशस्त्रपूतमव्याजं पुरुषाङ्गोपकल्पितम ।
विक्रीयते महामांसं गृह्यतां गृह्यतामिदम ॥

[2] S'árdúla-vikríḍita.

गुञ्जत्कुञ्जकुटीरकौशिकघटाघूत्कारसंवल्गित-
क्रन्दत्फेरवचण्डडात्कृतिभृतप्राग्भारभीमैस्तटैः ।
अन्तःशीर्णकरङ्ककर्परपयःसंरोधकूलंकष-
स्रोतोनिर्गमघोरघर्घररवा पारेश्मशानं सरित् ॥

piercing as the eagle's cry, and penetrating my soul as a voice but too well known. My heart feels rent within me; my limbs fail; I can scarcely stand. What means this?"[1]

"That piteous sound issued from the temple of Karálá. Is it not the resort of the wicked? a place for such deeds?[2] Be it what it may, I will look."

He walks round.

The scene opens; and discovers Kapálakuṇḍalá and Aghoraghaṇṭa, engaged in worshipping the idol: and Málatí dressed as a victim.

MÁL.] 'Ah unpitying father! the person whom thou wouldst make the instrument of conciliating the king's mind, now perishes. Ah fond mother! thou too art slain by the evil sport of fate. Ah venerable priestess! who lived but for Málatí, whose every effort was for my prosperity, thou hast been taught by thy fondness a lasting [143] sorrow. Ah gentle Lavangiká! I have been shown to thee but as in a dream.'[3]

MÁDH.] 'Surely it is she. Then I find her living.'

KAPÁLAKUṆḌALÁ *worshipping the idol* Karálá.] 'I bow to thee, divine Chámuṇḍá.'

[1] Mandákrántá.

नादस्तावद्विकलकुररीकूजितस्निग्धतार-
श्चित्ताकर्षी परिचित इव श्रोत्रसंवादमेति ।
अन्तर्भिन्नं भ्रमति हृदयं विह्वलत्यङ्गमङ्गं
देहस्तम्भः स्खलति च गतिः कः प्रकारः किमेतत् ॥

[2] Vaktra.

करालायतनादेवायमुच्चरन्करुणध्वनिः ।
विभाव्यते ननु स्थानमनिष्टानां तदीदृशम् ॥

[3] The Prákrit original of this passage, though prose, is too beautiful to be omitted.

'Há táda nikkaruṇa! eso dáṇi ṇarenda-chittárâhobaäraṇan jaṇo bibajjaï. Há amba siṇehamaä-hïae! tumam pi hadási debba-dubbilasideṇa. Há Máladímaä-jîvide, mama kalláṇa-sáhanekka-suha-saäla-bbábáre, bhaävadi! chirassa jánábidási dukkham siṇeheṇa. Há pïasahi Lavangïe! siviṇa-ávasara-metta-dansaṇá aham de sambuttá.'

"I revere thy sport, which delights the happy court of Śiva, while the globe of the earth, sinking under the weight of thy stamping foot, depresses the shell of the tortoise and shakes one portion of the universe, whence the ocean retires within a deep abyss that rivals hell."[1]

"May thy vehement dance contribute to our success and satisfaction; amidst the praise of attendant spirits, astonished by the loud laugh issuing from thy necklace of heads which are animated by the immortalizing liquid that drops from the moon in thy crest, fractured by the nails of the elephant's hide round thy waist, swinging to the violence of thy gestures: while mountains are overthrown by the jerk of thy arm, terrible for the flashes of empoisoned flame which issue from the expanded heads of hissing serpents closely entwined. The regions of space meantime are contracted, as within a circle marked by a flaming brand, by the roll[144]ing of thy head terrific for the wide flame of thy eye red as raging fire. The stars are scattered by the flag that waves at the extremity of the vast skeleton which thou bearest. And the three-eyed god exults in the close embrace of Gaurí, frightened by the cries of ghosts and spirits triumphant."[2]

[1] S'árdúlavikríḍita.

सावष्टम्भनिशुम्भनिर्भरनमद्भूगोलनिष्पीडन-
न्यञ्चत्कर्परकूर्मकम्पविगलद्ब्रह्माण्डखण्डस्थिति ।
पातालप्रतिमल्लगल्लविवरप्रक्षिप्तसप्तार्णवं
वन्दे नन्दितनीलकण्ठपरिषद्व्यक्तर्द्धि वः क्रीडितम् ॥

[2] The original stanza is in Daṇḍaka metre, of the species denominated Prachita and Sinhavikránta. The verse contains eighteen feet (2 Tr. 16 C.) or fifty-four syllables, and the stanza comprises 216 syllables.

प्रचलितकरिकृत्तिपर्यन्तचञ्चन्नखाघातभिन्नेन्दुनिस्यन्दमानामृतश्च्योत-
जीवत्कपालावलीमुक्तचण्डाट्टहासत्रसद्भूरिभूतप्रवृत्तस्तुति ।
श्वसदसितभुजंगभोगाङ्गदग्रन्थिनिष्पीडनस्फारफुत्कारफणापीठनिर्यद्विष-
ज्योतिरुज्जृम्भणोड्डामरव्यस्तविस्तारिदोःखण्डपर्यासितक्ष्माधरम् ॥

They both bow before the idol.

MÁDH.] 'Ah! what neglect.'

"The timid maid, clad as a victim in clothes and garlands stained with a sanguine dye, and exposed to the view [145] of these wicked and accursed magicians, like a fawn before wolves, is in the jaws of death; unhappy daughter of the happy Bhúrivasu. Alas! that such should be the relentless course of fate."[1]

KAPÁL.] "Now, pretty maid, think on him who was thy beloved. Cruel death hastens towards thee."[2]

MÁLATÍ.] 'Beloved Mádhava! remember me when I am gone. That person is not dead who is cherished in the memory of a lover.'

KAPÁL.] 'Ah! enamoured of Mádhava she will become a faithful dove. However that be, no time should be lost.'

AGHOR. *lifting the sword.*] "Divine Chámuṇḍá! accept this victim vowed in prayer and now offered to thee."[3]

अवहनवपिशङ्गफणेषच्छटाच्छन्नभीमोत्तमाङ्गभ्रमिप्रस्रुतातातचक्रक्रिया-
च्युतहिमभानुमुग्धखड्गाग्रकोटिशृङ्गध्वजोद्भूतविक्षिप्ततारागणम् ।
प्रमुदितकटपूतनोत्तालवेतालतालस्फुटत्कर्णसंभावितगौरीघनाश्लेषहृष्य-
न्मनस्त्र्यम्बकानन्दि तत्ताण्डवं देवि भूयादभीष्ट्यै च तुष्ट्यै च वः ॥

[1] S'árdúlavikríḍita.

न्यस्तालक्तकरक्तमाल्यवसना पाषण्डचाण्डालयोः
पापारब्धवतोर्मृगीव वृकयोर्भीरुर्गता गोचरम् ।
सेयं भूरिवसोर्वसोरिव सुता मृत्योर्मुखे वर्तते
हा धिक्कष्टमनिष्टमत्यकरुणः कोऽयं विधेः प्रक्रमः ॥

[2] Praharshiṇí.

तं भद्रे स्मर दयितोऽत्र यस्तवाभू-
द्देव त्वां त्वरयति दारुणः कृतान्तः ।

[3] Praharshiṇí.

चामुण्डे भगवति मंत्रसाधनादा-
वुद्दिष्टामुपनिहितां भजस्व पूजां ॥

[146] MÁDH. *rushing forward, raises Málatí in his arms.*] 'Wicked magician! thou art slain.'

KAPÁL.] 'Avaunt villain. Art thou not so?'

MÁL.] 'Save me, prince!' *She embraces Mádhava.*

MÁDH.] 'Fear nothing. "Thy friend is before thee, who banishing terror in the moment of death, has proved his affection by the efforts of despair. Cease thy trembling. This wicked wretch shall soon feel the retribution of his crime on his own head."'[1]

AGHOR.] 'Ah! who is he that dares to interrupt us?'

KAPÁL.] 'Venerable Sir! he is her lover; he is Mádhava, son of Kámandakí's friend, and a vendor of human flesh.'

MÁDH. *in tears.*] 'How is this? auspicious maid!'

MÁL. *sighing.*] 'I know not, Prince! I was sleeping on the terrace. I awoke here. But how came you in this place?'

MÁDH. *blushing.*] "Urged by the eager wish that I may be blessed with thy hand, I came to this abode of death to sell myself to the ghosts. I heard thy weeping. I came hither."[2]

[147] MÁL.] 'Alas! for my sake wert thou wandering regardless of thyself!'

MÁDH.] 'Indeed, it is an opportune chance.'

"Having happily saved my beloved from the sword of this murderer, like the moon's orb from the mouth of devouring

[1] Hariṇí.

मरणसमये त्यक्त्वा शङ्कां प्रतापनिरर्गल-
प्रकटितनिजस्नेहः सोऽयं सखा पुरएव ते ।
सुतनु विसृजोत्कम्पं संप्रत्यसाविह पाप्मनः
फलमनुभवत्वुग्रं पापः प्रतीपविपाकिनः ॥

[2] Vasantatilaka.

त्वत्पादपङ्कजपरिग्रहधन्यजन्मा
भूयासमित्यभिनिवेशकदर्थ्यमानः ।
आत्मप्रमांसपणनाय परेतभूमा-
वाकर्ण्य भीरु रुदितानि तवागतोऽस्मि ॥

Ráhu, how is my mind distracted with doubt, melted with pity, agitated with wonder, inflamed with anger, and bursting with joy."[1]

AGHOR.] 'Ah! thou Bráhman boy! "Like a stag drawn by pity for his doe, whom a tiger has seized, thou seekest thy own destruction, approaching me engaged in the worship of this place of human sacrifice. Wretch! I [148] will first gratify the great mother of beings with thy blood flowing from a headless trunk."'[2]

MÁDH.] 'Thou worst of sinful wretches! "How couldst thou attempt to deprive the triple world of its rarest gem, and the universe of its greatest excellence, to bereave the people of light, to drive the kindred to desperation, to humble love, to make vision vain, and render the world a miserable waste!"[3]

'Ah wicked wretch! "Hast thou dared to lift a weapon against that tender form, which even shrunk from the blow of light blossoms thrown in merry mood by playful damsels.

[1] S'árdúlavikrídita.

राहोश्चन्द्रकलामिवाननचरीं दैवात्समासाद्य मे
दस्योरस्य कृपाणपातविषयादाच्छिन्दतः प्रेयसीम् ।
आतङ्काद्विकलं द्रुतं करुणया विक्षोभितं विस्मयात्
क्रोधेन ज्वलितं मुदा विकसितं चेतः कथं वर्तताम् ॥

[2] S'árdúlavikrídita.

व्याघ्राघातमृगीकृपाकुलमृगन्यायेन हिंसारुचेः
पापप्राण्युपहारकेतनभुवः प्राप्तोऽसि मे गोचरम् ।
सोऽहं प्रागभवतीव भूतजननीमुत्प्रीणयामि खड्गाहति-
व्यस्तस्कन्धकबन्धरन्ध्ररुधिरप्रागभारनिःस्यन्दिना ॥

[3] S'ikhariṇí.

असारं संसारं परिमुषितरत्नं त्रिभुवनं
निरालोकं लोकं मरणशरणं बान्धवजनम् ।
अदर्पं कन्दर्पं जननयननिर्माणमफलं
जगज्जीर्णारण्यं कथमसि विधातुं व्यवसितः ॥

This arm shall light on thy head like the sudden club of Yama." '[1]

AGHOR.] 'Strike, villain! Art thou not such?'

MÁL. to MÁDH.] 'Be pacified, dear Mádhava! The [149] cruel man is desperate. Abstain from this needless hazard.'

KAPÁL. to AGHOR.] 'Venerable Sir, be on your guard. Kill the wretch.'

MÁDH. and AGHOR., *addressing the women.*] "Take courage. The wretch is slain. Was it ever seen that the lion, whose sharp fangs are fitted to lacerate the front of the elephant, was foiled in fight with deer?"[2]

A noise behind the scenes. They listen.

'Ho! ye guards who seek Málatí. The venerable and unerring Kámandakí encourages Bhúrivasu and instructs you to beset the temple of Karálá. She says this strange and horrid deed can proceed from none but Aghoraghaṇṭa; nor can aught else, but a sacrifice to Karálá, be conjectured.'

KÁPAL.] 'We are surrounded.'

AGHOR.] 'Now is the moment which calls for courage.'

MÁL.] 'Oh father! Oh venerable mother!'

MÁDH.] ''Tis resolved. I will place Málatí in safety with her friends, and slay this wicked sorcerer.'

[1] A very uncommon metre named Avitatha or Narkuṭaka.

प्रणयिसखीसलीलपरिहासरसाधिगतै-
र्ललितशिरीषपुष्पहननैरपि ताम्यति यत् ।
वपुषि वधाय तत्र तव शस्त्रमुपक्षिपतः
पततु शिरस्यकाण्डयमदण्ड इवैष भुजः ॥

[2] Vasantatilaka.

धैर्यं निधेहि हृदये हत एव पापः
किंवा कदाचिदपि केनचिदन्वभावि ।
सारंगसंगरविधाविभकुम्भकूट-
कुट्टाकपाणिकुलिशस्य हरेः प्रमादः ॥

Mádh. conducts Málati to the other side, and returns towards Aghoraghaṇṭa.

Aghor.[1]] 'Ah wretch! "My sword shall even now cut thee to pieces, ringing against the joints of thy bones, [150] passing with instantaneous rapidity through thy tough muscles, and playing unresisted in thy flesh like moist clay."'[2]

They fight. The scene closes.

[1] [The Calcutta ed. gives this speech to both combatants simultaneously.]
[2] S'ikhariṇí.

कठोरास्थिग्रन्थिव्यतिकररणत्कारमुखरः
खरस्नायुच्छेदक्षणविहितवेगव्युपरमः ।
निरातङ्कः पङ्केष्विव पिशितपिण्डेषु विलस-
न्नसिर्गात्रं गात्रं सपदि लवशस्ते विकिरतु ॥

SYNOPTICAL TABLES
OF
INDIAN PROSODY.

[151] *Feet used in Sanskrit Prosody.*

TRISYLLABIC.

M. — — — MOLOSSUS. M.
Y. ⏑ — — BACCHIUS. B.
R. — ⏑ — CRETICUS or AMPHIMACER. C.
S. ⏑ ⏑ — ANAPÆSTUS. A.
T. — — ⏑ ANTIBACCHIUS, PALIMBACCHIUS, or HYPOBACCHIUS. H.
J. ⏑ — ⏑ AMPHIBRACHYS or SCOLIUS. Sc.
Bh. — ⏑ ⏑ DACTYLUS. D.
N. ⏑ ⏑ ⏑ TRIBRACHYS. TR.

MONOSYLLABIC.

L. ⏑ BREVIS. BR. *G.* — LONGUS. L.

Feet used in Prákrit Prosody.

1 k. One *Mátrá* or *Kalá*. *Sara:* BREVIS ⏑ BR.
2 k. Two *Mátrás* or *Kalás*.
Hára: LONGUS — L.
Supriya: PYRRHICHIUS or PERIAMBUS. ⏑ ⏑ P.
3 k. Three *Mátrás* or *Kalás*.
Tála: TROCHÆUS — ⏑ T.
Dhwaja: IAMBUS ⏑ — I.
Táṇḍava: TRIBRACHYS ⏑ ⏑ ⏑ TR.
Haya: 4 k. *Mátrás* or *Kalás*.
Karṇa: SPONDÆUS — — S.
Payodhara: SCOLIUS ⏑ — ⏑ Sc.
Hasta: ANAPÆSTUS ⏑ ⏑ — A.
Charaṇa: DACTYLUS — ⏑ ⏑ D.
Vipra: PROCELEUSMATICUS ⏑ ⏑ ⏑ ⏑ PR.
[152] *Indrásana:* 5 k. Five *Mátrás* or *Kalás*.
CRETICUS C., BACCHIUS B., PÆON PÆ., etc.
Saroja: 6 k. Six *Mátrás* or *Kalás*.
MOLOSSUS M., etc.

Metre of the Vedas; regulated by the number of syllables. Seven classes subdivided into eight orders.

CLASSES.

ORDERS.	*Gáyatrí.*	*Ushṇih.*	*Anush-ṭubh.*	*Vṛihatí.*	*Pankti.*	*Trish-ṭubh.*	*Jagatí.*
Ársha............	24	28	32	36	40	44	48
Daiví............	1	2	3	4	5	6	7
Ásurí............	15	14	13	12	11	10	9
Prájápatyá.....	8	12	16	20	24	28	32
Yajus............	6	7	8	9	10	11	12
Sáman	12	14	16	18	20	22	24
Ṛich	18	21	24	27	30	33	36
Bráhmí.........	36	42	48	54	60	66	72

Distribution of the Syllables in Triplets, Tetrastichs, etc.

I. GÁYATRÍ.

1. Tripád........................8×3=24
2. Chatushpád...................6×4=24
3. Pádanichṛit[1] ....7×3=21
4. Atipádanichṛit ....6+8+7=21
5. Nágí ....9+9+6=24
6. Váráhí ....6+9+9=24
7. Vardhamáná............6+7+8=21
8. Pratishṭhá ....8+7+6=21
9. Dwipádviráj...............12+8=20
10. Tripádviráj ....11×3=33

II. USHṆIH.

1. Tripád (12+8×2).
   1. *Kakubh* ....8+12+8=28
   2. *Pura Ushṇih* ....12+8+8=28
   3. *Paroshṇih* ....8+8+12=28
2. Chatushpád ....7×4=28

III. ANUSHṬUBH.

1. Chatushpád ....8×4=32
2. Tripád (8+12×2), viz. 12+8+12, or 12+12+8, or 8+12+12=32.

IV. VṚIHATÍ.

1. Chatushpád ....9×4=36
2. .... 8×2+10×2=36
3. .... 8×3+12 =36
   1. *Pathyá* .... 8+8+12+8=36
   2. *Nyankusáriṇí* (*Skandhogrívá*[2] or *Urovṛihatí*), 8+12+8+8=36.
   3. *Uparishṭádvṛihatí*, 8×3+12=36.
   4. *Purastádvṛihatí*, 12+8×3=36.
4. Mahávṛihatí (Satovṛihatí), 12×3 =36.

[153] V. PANKTI.

1. Chatushpád (12×2+8×2).
   1. *Sataḥ-p.*......... 12+8+12+8=40
      or .... 8+12+8+12=40
   2. *Ástára-p.* ...... 8+8+12+12=40
   3. *Prastára-p.* ... 12+12+8+8=40
   4. *Vistára-p.* ... 8+12+12+8=40
   5. *Sanstára-p.* ... 12+8+8+12=40
2. 1. *Aksharapankti*............5×4=20
   2. *Alpaśaḥpankti*............5×2=10
   3. *Padapankti* ....5×5=25
   4. .... 4+6+5×3=25
3. Pathyá ....8×5=40
4. Jagatí ....8×6=48

VI. TRISHṬUBH.

1. Jyotishmatí ....11+8×4=43
2. Jagatí ....12+8×4=44
   Purastájjyotishmatí.........11 (12) +8×3.
   Madhyá ......8+8+11 (12) +8+8.
   Uparishṭád...8+8+8+8+11 (12).

[1] [I have here and elsewhere corrected the old *nivṛit*.] [2] [— *grívi ?*]

Deficient and exuberant Metre.

1. S'ankumatí = 5 + a × 3, ex. (Gáyatrí) 5 + 6 × 3 = 23.
2. Kakudmatí = 6 + a × 3.
3. Pipílikamadhyá = (Tripád) = many + few + many, ex. 8 + 4 + 8.
4. Yavamadhyá = (Tripád) = few + many + few, ex. 8 + 10 + 8.
5. Nichṛit = a — 1, ex. (Gáyatrí) 24 — 1 = 23.
6. Bhurij = a + 1, ex. (Gáyatrí) 24 + 1 = 25.
7. Viráj = a — 2, ex. (Gáyatrí) 8 + 8 + 6 = 22.
8. Swaráj = a + 2, ex. (Gáyatrí) 8 + 8 + 10 = 26.[1]

I.—*Gaṇavṛitta of Sanskrit Prosody, and Mátrávṛitta of Prákrit Prosody; regulated by quantity.*

1. *Áryá* or *Gáthá*, Pr. *Gáhá*. 30 + 27 = 57 k.

Odd verse: 30 k. = 7½ ft. (6th = Sc. or Pr.).

Even verse: 27 k. = 7½ ft. (6th = Br.).

Each verse ends in L.

Pause in 1st verse before 7th ft. if Pr. But if 6th ft. be Pr., then pause after 1st syllable.

Pause in 2nd verse before 5th ft. if Pr.

[154] 16 Species: *Pathyá:* Pause after 3rd ft. (3 + 4½ = 7½ ft. and 12 + 18 + 12 + 15 = 57 k.). *Vipulá:* Pause placed otherwise. Hence *Ádivipulá*, *Antyavipulá* and *Ubhayavipulá*, with 1st verse, 2nd, or both, irregularly divided by the pause. *Chapalá* 1st f. S. or A. 2nd Sc. 3rd. S. 4th Sc. 5th S. or D. 6th Sc. or Pr. (in the short verse Br.), 7th S. D. A. or Pr. Hence *Mukhachapalá*, *Jaghanyachapalá* and *Mahâchapalá*, with 1st, 2nd or both verses so constructed. Therefore *Áryá* + 3 *Chapalás* × *Pathyá* + 3 *Vipulás* = 16 species.[2]

Variations: *Áryá*, 1st verse 10,800. 2nd verse 6,400. *Chapalá* 1st verse 32, 2nd verse 16.

In *Prákrit* prosody, 27 species: from 27 L. + 3 Br. = 30 syll. to 1 L. and 55 Br. = 56 syll.

Specific varieties. *Kuliná* containing 1 Sc. *Kulathá*, 2 Sc. *Veśyá*, many Sc. *Raṇḍá*, no Sc. *Gurviṇí*, Sc. 1st, 3rd, 5th or 7th ft. But this is against rule: which excludes amphibrachys from the odd feet.

2. *Udgíti* or *Vigáthá*, Pr. *Vigáhá*. 27 + 30 = 57 k. viz. 12 + 15 + 12 + 18.

3. *Upagíti*, Pr. *Gáhu*. 27 + 27 = 54 k. viz. 12 + 15 + 12 + 15.

4. *Gíti* or *Udgáthá*, Pr. *Uggáhá*. 30 + 30 = 60 k. viz. 12 + 18 + 12 + 18.

5. *Áryágíti* or *Khandhaka*, Pr. *Skandha*. 32 + 32 = 64 k.

8 ft. complete. 3 + 5 = 8 ft. and 12 + 20 + 12 + 20 = 64 k.

Species 16 (*Pathyá*, etc.), variations of each verse 10,800.

In *Prákrit* prosody, 28 species from 28 L. and 8 Br. to 1 L. and 62 Br.

6. *Chandriká*, *Sangíti* or *Gáthiní*, Pr. *Gáhiní*. 30 + 32 = 62 k. viz. 12 + 18 + 12 + 20.

[1] If there be room to doubt whether the metre be reduced from the next above, or raised from the next below, the first verse determines the question; for it is referred to the class to which the first verse or *páda* belongs. If this do not suffice, the metre is referred to that class, which is sacred to the deity, to whom the prayer is addressed. Should this also be insufficient, other rules of selection have been provided. Sometimes the metre is eked out by substituting *iya* or *uva* for correspondent vowels. This, in particular, appears to be practised in the *Sámaveda*.

[2] [Cf. *Ind. Stud.* viii. p. 297.]

7. *Sugíti*, or *Parigíti*, Pr. *Sinhiní*. 32 + 30 = 62 k. viz. 12 + 20 + 12 + 18.

Also

6. *Sangíti*, 32 + 29 = 61 k.
A'ryá (7½ ft.) + L. in both verses.

7. *Sugíti*, 32 + 27 = 59 k.
+L. in first verse only.

8. *Pragíti*, 30 + 29 = 59 k.
+L. in second verse only.

9. *Anugíti*, 27 + 32 = 59 k.
Reverse of Sugíti.

10. *Manjugíti*, 29 + 30 = 59 k.
Reverse of Pragíti.

11. *Vigíti*, 29 + 29 = 58 k.
Upagíti + L. in both verses.

12. *Chárugíti*, 29 + 32 = 61 k.
Reverse of Sangíti.

13. *Vallarí*, 32 + 30 = 62 k.
A'ryágíti—L. in last verse.

14. *Lalitá*, 30 + 32 = 62 k.
—L. in first verse.

15. *Pramadá*, 29 + 27 = 56 k.
Upagíti + L. in first verse.

16. *Chandriká*, 27 + 29 = 56 k.
+ L. in last verse.

All these kinds admit 16 species as above: viz. *Pathyá*, etc.

[155] II.—*Mátrávṛitta or Mátráchhandas, of Sanskrit Prosody.*

1. VAITÁLÍYA, 56 to 68 k.
   1. *Vaitálíya*, 14 + 16 + 14 + 16 = 60 k.
      End in C. + I.
      Short syllables by pairs (even verses not to begin with 2 Tr.)
   2. *A'patáliká*, End in D. and S.
   3. *Aupachhandasika*, 16 + 18 + 16 + 18 = 68 k. End in C. & B.

   Each kind admits 8 varieties of the short verse and 13 of the long; from 3 long syll. to 6 short beginning the one, and from 4 long syll. to 1 long and 6 short in the other.

   Also the following species under each kind.

   1. *Dakshiṇántiká*, begin with I. Comprising 2 varieties of the odd verses.
      I. I. (or Tr.); and 4 of the even verses. I. B. (or Pæ. 2nd or 4th or 5 Br.)
   2. *Udíchya-vṛitti*, odd verses begin with I.
   3. *Práchya-vṛitti*, even verses, C. or Pæ. 4.
   4. *Pravṛittaka*, the two preceding combined.
   5. *Aparántiká*, 16 × 4 = 64 k. (*Prách.*).
   6. *Chárubásiní*, 14 × 4 = 56 k. (*Udích.*).
2. MÁTRÁSAMAKA, 16 (4×4)×4 = 64 k.
   End S. or A. Begin S. A. D. or Pr.
   1. *Mátrásamaka*, 2nd ft. S. A. or D. 3rd ft. A.
   2. *Viśloka*, 2nd Sc. or Pr. 3rd S. or D.
   3. *Vánavásiká*, 2nd S. A. or D. 3rd Sc. or Pr.
   4. *Chitrá*, 2nd Sc. or Pr. 3rd A. Sc. or Pr.
   5. *Upachitrá*, 2nd S. A. or D. 3rd S. or D.
   6. *Pádákulaka*, the above intermixed.

   The 1st species admits 24 varieties; the 2nd, 32; and the 3 next, 48 each. The variations of the last species very numerous.
3. GÍTYÁRYÁ or *Achaladhṛiti*, 16×4. All short syllables.
4. DWIKHAṆḌIKÁ[1]; or Couplet.
   1. *S'ikhá* or *Chúḍá*, 32 Br. + 16 L.
      Two species: *Jyotis*, 1st verse 32 Br. 2nd 16 L.
      Saumyá or *Anangakríḍá* 1st verse 16 L. 2nd 32 Br.
      Also 1. *S'ikhá* 30 + 32 = 62 k.
      1st Verse 28 Br. + L. 2nd 30 Br. + L.

[1] [In As. Res. *dwikhaṇḍaka*.]

2. *Khanjá*, 32 + 30 = 62 k.
1st 30 Br. + L. 2nd 28 Br. + L.

3. *Chúliká* or *Atiruchirá* 29 + 29 = 58 k. 27 Br. + L.

Also 3. *Chúliká* 29 + 31 = 60 k.
1st Verse 27 Br. + L. 2nd 29 Br. + L.

[156] III.—*Mátrávṛitta of Prákrit Prosody continued from Table I.*

8. Dwipathá, Pr. *Dohá*, 13 + 11 + 13 + 11 = 48 k.
3 ft., viz. odd verse 6 + 4 + 3; even verse 6 + 4 + 1.
23 species from 23 L. + 2 Br. to 48 Br.

9. Utkachhá, Pr. *Ukkachhá*, 11×6 = 66 k.
6 verses, 3 ft. each, 4 + 4 + 3.
8 species, from 66 Br. to 28 L. + 10 Br.

10. Rolá or Lolá, 24 × 4 = 96 k. Pausè 11 + 13. Usually end in L. 12 species, from 12 L. to 24 Br.

11. Gandhá, Pr. *Gandhána*, 17 + 18 + 17 + 18 = 70 Syll.

12. Chatushpadá or Chatushpadiká, Pr. *Cháupaïa*, *Cháüpdä*, 30 × 4 × 4 = 480 k.
16 verses: 7½ ft. 4×7 + L.

13. Ghaṭṭá and Ghaṭṭánanda, 31 × 2 = 62 k. 10 + 8 + 13 = 4 × 7 + 3 Br. or 11 + 7 + 13 = 6 + 3 × 3 + 5 + 4 + 3 + 2 + 2 Br.

14. Shaṭpadá or Shaṭpadiká, Pr. *Chhappdä*, 96 + 56 = 152 k.
Kávya 24 (11 + 13 = 6 + 4 × 4 + 2 Br.) × 4 = 96, Ullála 28 (15 + 13) × 2 = 56. Varieties of the Tetrastich 45, from 96 Br. to 44 L. + 8 Br. Varieties of the whole stanza 71, from 70 L. + 12 Br. to 152 Br.

15. Prajjaṭiká, Pr. *Pajjaṟiá*, 16 × 4 = 64 k. 4 ft. End in Sc.

16. Atiliha Aṭhillá, Pr. *Atilá*, 16×4 = 64 k. No Sc. End in P.

17. Pádákulaka, Pr. *Kulapdä*, 16×4 = 64 k. 6 + 4 × 2 + 2 L.

18. *Raḍḍhá* stanza of nine = 116 k. viz.
1st = 15 k. = 4 ft. viz. 3 + 4 + 4 + 4. End in Sc. or Pr.
2nd = 12 k. = 4 ft. End in Pr.
3rd = 15 k. End in D.
4th = 11 k. = 3 ft. End in Tr.
5th = 15 k. End in D.
6th to 9th = Dohá as before.
Five species.

19. Padmávatí, Pr. *Päumá*, 32 × 4 = 128 k. 8 ft. no Sc.

20. Kuṇḍaliká, Pr. *Kuṇḍaṟiá*, stanza of eight = 142 k.
Dohá + Rolá or Kávya.

21. Gagaṇánganá, 25×4 = 100 k. 20 syll. viz. 5 L. and 15 Br. End in I.

22. Dwipadí or Dwipadá, 28×2 = 56 k. 6½ ft. viz. 6 + 4 + 5 + L.

23. Khanjá, 41×2 = 82 k.
10ft. viz. 9 Pr. + K.

24. S'ikhá, 28×2 = 56 k.
7 ft. viz. 6 Pr. + Sc. See Sanskrit metre.

25. Málá, 45×2 = 90 k.
11 ft. viz. 4×9 + C + S.
Also 25. Málá 45 + 27 = 72 k.
1st verse as above, 2nd verse *A'ryá*.

26. Chúḍikalá, Pr. *Chúṟialá*, 29×2 = 58 k. Half the Dohá + 5.

27. Sauráshṭra, Pr. *Soraṭṭha*, 11 + 13 + 11 + 13 = 48 k.
Reverse of the Dohá.

28. Hákali, 14×4 = 56 k.
3½ ft. viz. 4×3 + L. (syll. 11 or 10). ft. D. Pr. or A. sometimes S. Not end in P. S.

29. Madhubhára, 8 × 4 = 32 k. 2 ft. End in Sc.

30. Abhíra, 11×4 = 44 k.
7 + Sc. or D. + I. + Sc. or Sc. + Tr. + Sc.

[157] 31. Daṇḍakala, 32×4 = 128 k. 4 × 4 + 6 + 2 + 8 or 10 + 8 + 14. End in L.

32. Dípaka, 10 × 4 = 40 k.
4 + 5 + Br. usually end in Sc.

33. Sinhávaloka, Pr. *Sinhálão*, 16×4 = 64 k.
4 ft. A. or Pr. but end in A.

34. Plavangamá, Pr. *Parangamá*, 21×4 = 84 k.
6×3 + I. Begin with L.

35. Lílávatí, 24 or less × 4 = 96 or less, 6 ft. or less: not end in A.

36. Harigítá, 28×4 = 112 k.
5 + 6 + 5 × 3 + L. Should begin with Pr. and end in S.

37. Tribhangí, 32 × 4 = 128 k. 8 ft. No Sc. End in L.

38. Durmilá or Durmiliká, 32 × 4 = 128 k.
10 + 8 + 14. ft. 8.

39. Híra or Híraka, 23×4 = 92 k.
4 ft. viz. 6 × 3 + 5. ft. 6 Br. or 1 L. with 4 Br. End in L.

40. Jaladhara or Jalaharaṇá, 32 × 4 = 128 k.
Pauses 10 + 8 + 6 + 8. ft. 8. Generally Pr. End in A.

41. Madanagṛiha or Madanahará, 40×4 = 160 k.
10 + 8 + 14 + 8 = 40.

42. Mahárásht̤ra, Pr. *Marahat̤t̤a*, 29×4 = 116 k.
10 + 8 + 11 or 6 + 4 × 5 + L. + Br.

Also the following kinds:

43. Ruchirá, 30×4 = 120 k. 7½ ft. end in L.

44. Kaliká, 14×4 = 56 k.
Pauses 8 + 6.

45. Vásaná, 20×4 = 80 k.
4 ft. End in C. Pause before the last.

46. Chaurola, 16 + 14 + 16 + 14 = 60 k. ft. A. or Pr.

47. Jhallaná, 37×4 = 148 k.
7½ ft. 5×7 + L. Pauses 10 + 10 + 10 + 7.

48. Asháḍha, 12 + 7 + 12 + 7 = 38 k.

49. Málaví, 16 + 12 + 16 + 12 = 56 k.
Long verse 4 ft., short verse end in L.

50. Mattá, 20×4 = 80 k.
5 ft. no Sc.

51. Rasamúlá, 24×4 = 96 k.
6 ft.

52. Avalambaka, 13×4 = 52.
3 ft. 4×2 + 5. End in L.[1]

IV.—*Metre regulated by number of syllables.*

Vaktra, 8×4 = 32 syll
2 ft. between 2 syll. The species vary in the 2nd ft. or 3rd place.

1. Simple *Vaktra.*
L. or Br. + M. etc. (except Tr. and A. and, in the even verse, C.) + B. + L. or Br. Therefore 1st, 4th and 8th syll. either long or short. 5th short. 6th and 7th long. Either 2nd or 3rd long.

Variations of the 1st verse, 24; of the 2nd, 20.

2. *Pathyá.*
1st verse as above; 2nd with Sc. for 2nd ft. Hence 7th syll. short.

[158] 3. *Viparíta-pat̤hyá.*
The preceding transposed.

4. *Chapalá.*
1st verse with Tr. for 2nd ft. Therefore 6th and 7th syll. short.

5. *Vipulá.*
2nd verse (some say 1st, others all) with 7th syll. short. Therefore 2nd ft. D. Sc. H. or Tr.
5 or 7 species: *Bha-vipulá*, 1st verse, (some say either) with D. for 2nd ft. *Ra-vipulá*, with C. for 2nd ft. *Na-vipulá*, 2nd ft. Tr. *Ta-vipulá*, 2nd ft. H. *Ma-vipulá*, 2nd ft. M. *Ya-vipulá*, 8 ft. B. *Ja-vipulá*, 2nd ft. Sc.

No instance occurs with an anapæst for the 2nd ft. or 3rd place.

[1] [The exact spelling of several of the above names is uncertain.]

V.—*Aksharachhandas or Varnavritta. Metre regulated by number and quantity.*

Regular or uniform metre; the stanza being composed of equal and similar verses. From one to five syllables in the verse, or from four to twenty in the stanza.

I. Ukta or Uktha, 1×4=4.

1. S'rí, *g.*=L. 2 Mahí, *l.*=Br.

II. Atyukta, 2×4=8.

1. Strí, or Káma, 2 *g.*=S. 2. Rati or Mahí, *l. g.*=I. 3. Sáru, *g. l.*=T. 4. Madhu, Pr. *Mahu*, 2 *l.*=P.

III. Madhyá, 3×4=12.

1. Nárí, or Tálí, *m.*=M. 2. S'así, Pr. *Sasi*, *y.*=B. 3. Priyá, Pr. *Pía*; or Mrigí, *r.*=C. 4. Ramaní or Ramaná, *s.*=A. 5. Panchála, or Pánchála, *t.*=H. 6. Mrigendra, Pr. *Maïnda*, *j.*=So. 7. Mandara, *bh.*=D. 8. Kamalí, or Kamala, *n.*=Tr.

IV. Pratishthá, 4×4=16.

1. Kanyá, or Tírnn, Pr. *Tinnd*, *m. g.*=2 S. 2. Ghárí, or Háriká, *r. l.*=2 T. 3. Nagáliká, Lagáliká, Nagání, or Nagániká, Pr. *Nagáníá* or *Nagáni*, *j. g.*=2 I. 4. Sati, *n. g.*=P. I.

V. Supratishthá, 5×4=20.

1. Pankti, Aksharapankti, or Hansa, *bh.* 2 *g.*=D. S. 2. Sammohá, *m.* 2 *g.*=M. S. 3. Háritabandha, or Hárí, 2 *g. l.* 2 *g.* or *t.* 2 *g.*=S. B. 4. Priyá, 2 *l. r.*=A. I. 5. Yamaka, Pr. *Jamaka*, *n.* 2 *l.*=P. Tr.

[159] *From six to twenty syllables in the Verse.*

I. GA'YATRI', 6×4=24.

1. Tanumadhyá, *t y.*=S P S. 2. Vidyullekhá, or S'esha, Pr. *Sesá*, 2 *m*=3 S. 3. S'asivadaná, or Chauransá, *n y*=2 P S. 4. Vasumatí, *t s*=S P I. 5. Vanitá, or Tilaka, Pr. *Dillá*, 2 *s*=2 A. 6. Yodha, or Dwiyodhí, Pr. *Vijoha*, 2 *r*=T S I. 7. Chaturansá, Pr. *Cháuvansá*, *n y*=2 P S. 8. Manthána, or Kámávatára, (half of the *Sáranga*), 2 *t*=S I T. 9. S'ankhanárí, or Somarájí, (half of the *Bhujangaprayáta*), 2 *y*=I T S. 10. Málatí, Sumálatí, Vasanta, or Káminíkánta, 2 *j*=I P T. 11. Damanaka, 2 *n*=3 P.

II. USHNIH, 7×4=28.

1. Kumáralalitá, (2+5) *j s g*=I+Tr. S. 2. Madalekhá, *m s g*=S D S. 3. Hansamálá, *s r g*=A T S. 4. Madhumatí, 2 *n g*=2 P A. 5. Sumániká, *r g l*=2 T C.[1] 6. Suvása, *n j l*=2 P D. 7. Karahanchá, *n s l*=2 P Sc. 8. S'írshá, Pr. *Sísá*, 2 *m g*=2 S M.

III. ANUSHTUBH, 8×4=32.

1. Chitrapadá, 2 *bh.* 2 *g*=2 D S. 2. Vidyunmálá, Pr. *Bijjúmálá*, (4+4‡) 2 *m* 2 *g*=2 S+2 S. 3. Mánavaka, or Mánavakákrídá, (4+4†) *bh. t l g*=T I+T I. 4. Hansaruta, *m n* 2 *g*=S D B. 5. Pramániká, Nagaswarúpiní, or Matalliká, *j r l g*=4 I. 6. Samániká, or Malliká, *r j g l*=4 T. 7. Vitána, *j t* 2 *g*=2 I T S. 8. Tungá, 2 *n* 2 *g*=3 P S. 9. Kamala, 2 *l n r*=2 P 2 I. 10. Hansapadí, 2 *g m s*=2 S T I. 11. Mátangí, *m* 2 *l m*=S T I S. 12. Rambhá, *n l g m*=2 P 2 S.

IV. VRIHATI', 9×4=36.

1. Halamúkhí, (3+6), *r n s*=C+2 P I. 2. Bhujagas'is'usrita, (7+2), 2 *n m*=2 P A+S. 3. Bhadriká, *r n r*=2 T A I. 4. Mahálakshmí, 3 *r*=T S B I. 5. Sárangí, or Sárngí, *n y s*=2 P S A. 6. Pávitra, Pr. *Páyittá*, *m bh. s*=2 S P A. 7. Kamalá, 2 *ns*

[1] [*r j g*=2 T C.?]

=3 P A. 8. Bimbá, *n s y*=P. Tr. T S. 9. Tomara, *s* 2 *j*=A I P T. 10. Rúpamálí, *r m*[1]=3 S M. 11. Maṇimadhya or Maṇibandha, *bh. r s*= D 2 T I. 12. Bhujangasangatá, *s j r* =A 3 I.

V. PANKTI, 10×4=40.

S'uddhavirāj, *m s j g*=S T 3 I. 2. Paṇava, (5+5) *m n y g*=S D+A S or *m n j g*=S D+A I. 3. Mayúrasariṇí, *r j r g*=4 T S. 4. Mattá, (4+6), *m bh. s g*=2 S+2 P S. 5. Upasthita, (2+8) *t* 2 *j g*=S+2 A I. 6. Rukmavatí or Champakamálá (5+5§) *bh. m s g*=D S+D S. 7. Manoramá, *n r j g*=P 4 I. 8. Sanyuktá, Pr. *Sanjutá*, *s* 2 *j g*=P 2 T 2 I. 9. Sáravatí, 3 *bh. g*=2 D T I. 10. Sushamá, *t y bh. g*=S A S A. 11. Amṛitamatí, or Amṛitagati, *n j n g*=P A P A. 12. Hansí, (4+6), *m bh. m g*= 2 S Tr. S.[2] 13. Chárumukhí, *n y bh. g* =P A S A. 14. Chandramukhí, *t n bh. g*=S P 2 A.

[160] VI. TRISHṬUBH, 11×4=44.

1. Indravajra, 2 *t j* 2 *g*=S I D T S. 2. Upendravajra, *j t j* 2 *g*=2 I D T S. 3. Upajáti, or A'khyánakí, (14 species). *The two foregoing intermixed.* 4. Dodhaka, Bandhu or Nílaswarúpa, 3 *bh.* 2 *g*=3 D S. 5. S'álíní, (4+7†), *m* 2 *t* 2 *g*=2 S+C T S. 6. Vátormí, (4+7†), *m bh. t* 2 *g*=2 S+A T S. 7. Bhramaravilasita, (4+7†), *m bh. n l g* =2 S+2 P A. 8. Rathoddhatá, *r n r l g*=2 T A 2 I. 9. Swágatá, *r n bh.* 2 *g*=2 T A P S. 10. Vṛintá or Vṛittá, (4+7†), 2 *n s* 2 *g*=3 P A S. 11. S'yeniká, or S'reṇiká, *r j r l g*=4 T C. 12. Sumukhí, (5+6‡), *n* 2 *j l g*=P A +2 A. 13. Bhadriká, 2 *n r l g*=2 P A 2 I. 14. Mauktikamálá, S'rí, Anukúlá or Kudmaladantí, (5+6), *bh. t n* 2 *g*=D S+2 P S. 15. Upasthitá, *j s t* 2 *g*=I Tr. S T S. 16. Upachitrá or Vis'eshiká, 3 *s l g*=3 A I.

17. Kupurushajanitá, 2 *n r* 2 *g*=2 P A I S. 18. Anavasitá, *n y bh.* 2 *g*=2 P S D S. 19. Moṭanaka, *t* 2 *j l g*=S 3 A. 20. Málatímálá, 3 *m* 2 *g*=4 S M. 21. Damanaka, *r n l g*[3]=4 P A. 22. Madándhá, *m s j* 2 *g*=S 2 T S.

VII. JAGATÍ, 12×4=48.

1. Vans'astha or Vans'asthavila, *j t j r*=2 I T 3 I. 2. Indravans'á, 2 *t j r* =S I T 3 I. 3. Upajáti, *the two foregoing intermixed.* 4. Toṭaka, 4 *s*=4 A. 5. Drutavilambita, *n* 2 *bh. r*=P I 2 A I. 6. S'ríputa or Puta, (8+4), 2 *n m y*=3 P S+T S. 7. Jaloddhatagati, (6+6), *j s j s*=I P I+I P I. 8. Tata or Lalitá, 2 *n m r*=3 P 2 S I. 9. Kusumavichitrá, (6+6), *n y n y*= 2 P S+2 P S. 10. Chanchalákshiká, Pramuditavadaná, Mandákiní, Gaurí or Prabhá, (7+5), 2 *n* 2 *r*=2 P A+B I. 11. Bhujangaprayáta, 4 *y*=I T S I T S. 12. Sragviṇí or Lakshmídhara, 4 *r*=T S I T S I. 13. Pramitákshará, *s j* 2 *s*=A Sc. 2 A. 14. Kántotpíḍá or Jaladharamálá, (4+8), *m bh. s m*=2 S+2 P 2 S or *bh. m s m* =D 3 D 2 S[4] 15. Vais'wadeví, (5+7), 2 *m* 2 *y*=M S+T S B. 16. Navamáliní, (8+4), *n j bh. y*=2 P 2 T+P S. 17. Chandravartma, (4+8‡), *r n bh. s*=2 T+P D A. 18. Priyamvadá, *n bh. j r*=P I P 3 I. 19. Maṇimálá, (6+6), *t y t y*=S P S+S P S. 20. Lalitá, *t bh. j r*=S I P 3 I. 21. Ujjwalí, 2 *n bh. r*=3 P T 2 I. 22. Málatí or Varatanu, (5+7), *n* 2 *j r*=P A +A 2 I. 23. Támarasa or Lalitapada, *n* 2 *j y*=2 P 2 D S. 24. Lalaná, (5+7) *bh. m* 2 *s*=D S+D T I or *bh. t n s*=D S+2 P A. 25. Drutapada, *n bh. n y*=P I 3 P S. 26. Vidyádhara, (4+8), 4 *m*=2 S+4 S. 27. Sáranga, 4 *t*=S I T S I T. 28. Mauktikadáma, 4 *j*=I P T I P T. 29. Modaka, 4 *bh.* = 4 D. 30. Taralanayaní, 4 *n*=6 P.

[1] [3 *m*?] [2] [= SAM?] [3] [*n l g*?] [4] [D S D 2 S?]

VIII. ATIJAGATÍ, 13 × 4 = 52.

1. Praharshiṇí, (3+10) *m n j r g* = M + 2 P 2 T S. 2. Ru[161]chirá, or Atiruchirá, (4+9) *j bh. s j g* = 2 I + 2 P T C. 3. Mattamayúra, or Máyá, (4+9) *m t y s g* = 2 S + T I D S. 4. Gaurí, 2 *n* 2 *r g* = 3 P T S B. 5. Manjubháshiṇí, Prabodhitá, Sunandiní, or Kanakaprabhá *s j s j g* = A I + P 3 I. 6. Chandriká, Kshamá, Utpaliní, or Kuṭilagati, (7+6) 2 *n* 2 *t g* = 2 P A + T S I. 7. Kalahansa, Chitravatí, or Sinhanáda, *s j* 2 *s g* = P 2 T P D S. 8. Chanchariḱávalí, *y m* 2 *r g* = I 2 S C T S. 9. Chandralekhá, (6+7) *n s r y g* = 2 P I + 2 T M. 10. Vidyut, (6+7) *n s* 2 *t g* = 2 P I + S I C. 11. Mṛigendramukha, *n* 2 *j r g* = P A P 2 T S. 12. Táraka, 4 *s g* = 3 A P S. 13. Kalákanda, or Kanda 4 *y l* = B I T S I T. 14. Pankajávalí, or Pankávalí, *bh. n* 2 *j l* = D 2 P 2 D. 15. Chaṇḍí, 2 *n* 2 *s g* = 4 P D S. 16. Prabhávatí, (4+9) *t bh. s j g* = S I + 2 P T C.

IX. S'AKKARÍ, 14×4 = 56.

1. Asambádhá, (5+9) *m t n s* 2 *g* = M S + 2 P A S. 2. Aparájitá, (7+7) 2 *n r s l g* = 2 P A + I A I or *s n r s l g* = P T A I A I. 3. Praharaṇakalitá, or Kaliká, (7+7) 2 *n bh. n l g* = 2 P A + 2 P A. 4. Vasantatilaka, Sinhonnatá, Uddharshiṇí, Madhumádhaví, or S'obhávatí, *t bh.* 2 *j* 2 *g* = S I P I P T S. 5. Lolá, or Alolá, (7+7) *m s m bh.* 2 *g* = S D S + S D S. 6. Induvadaná, or Varasundarí, *bh. j s n* 2 *g* = T P T P T P S. 7. Nadí, (7+7) 2 *n t j* 2 *g* = 2 P A + D T S. 8. Lakshmí, *m s t bh.* 2 *g* = S D S T D S. 9. Supavitrá, (8+6) 4 *n* 2 *g* = 4 P + 2 P S. 10. Madhyakshamá, (4+10) or Kuṭilá, (4+6+4) *m bh. n y* 2 *g* = 2 S + 3 P + 2 S. 11. Pramadá, *n j bh. j l g* = 2 P 2 T P T I. 12. Manjarí, (5+9) *s j s y l g* = P 2 T P T S I. 13. Kumárí, (8+6) *n j bh. j* 2 *g* = 2 P 2 T P T S. 14. Sukesara, *n r n r l g* = P 2 I P 3 I. 15. Vásantí, *m t n m* 2 *g* = 2 S D A 2 S. 16. Nándímukhí, (7+7) 2 *n* 2 *t* 2 *g* = 3 P S I T S. 17. Chakra, or Chakrapáta, *bh.* 3 *n l g* = T 5 P I. 18. Lílopavatí, (4+10) 4 *m* 2 *g* = 2 S + 5 S. 19. Naṭagati, 4 *n* 2 *g* = 6 P + S. 20. Kopavatí, *bh. m s t l g* = D S D S T I.

X. ATIS'AKKARÍ, 15×4 = 60.

1. Chandrávartá, (7+8‡) 4 *n s* = 2 P Tr. + P Tr. A. 2. Málá, or Sraj, (6+9) 4 *n s* = 2 Tr. + 2 Tr. A. 3. Maṇiguṇanikara, (8+7) 4 *n s* = 4 P + 2 P A. 4. Máliní, or Nándímukhí, (8+7) 2 *n m* 2 *y* = 3 P S + C T S. 5. Chandralekhá, (7+8) *m r m* 2 *y* = 2 S B + S I T S. 6. Kámakríḍá, Lílakhela, or Sárangiká and Sarangaka, 5 *m* = 6 S M. 7. Prabhadraka, or Subhadraka and Sukesara, (7+8) *n j bh. j r* = 2 P C + P 3 I. 8. Elá, (5+10) *s j* 2 *n y* = A I + 4 I T.[1] 9. Upamáliní, (8+7) 2 *n t bh. r* = 3 P T + S A I.[2] 10. Vipinatilaka, *n s n* 2 *r* = 2 P I Tr. T S I. 11. Chitrá, 3 *m* 2 *y* = 3 S M I T S. 12. Túṇaka, or Chámara, (8 L 7 Br. = 23 k.) = 6 T C. 13. Bhramarávalí, 5 *s* = 5 A. 14. Manahansa,[3] [162] *s* 2 *j bh. r* = A I P 2 T 2 I. 15. S'arabha, or S'as'ikalá, 4 *n* + *s* = 6 P A. 16. Nis'ipála, *bh. j s n r* = D I P I P 2 I. 17. Utsara, *r n* 2 *bh. r* = 2 T 3 A I. 18. Hansa, (8+7) *n* 2 *j r y* = 2 P D 3 T S.

XI. ASHṬI, 16×4 = 64.

I. Ṛishabhagajavilasita, or Gajaturangavilasita, (7+9) *bh. r* 3 *n g* = D 2 T + 3 P A. 2. Váṇiní, *n j bh. j r g* = 2 P 2 T P 2 T S. 3. Chitra, Chitrasanga, Atisundara or Chanchalá (double *Samániká*) *r j r j r l* = 8 T. 4. Panchachámara, Náracha, or Narácha, (double *Pramáṇiká*), *j r j r j g* = 8 I. 5. Dhíralalita, *bh. r n r n g* = D 2 T P 2 T A. 6. Khagati, Nila, Lílá, or As'wagati, 5 *bh. g* = 4 D T I. 7. Cha-

[1] [A I + 4 P S?] [2] [3 P S + I A I?] [3] [Manohansa?]

kita (8 + 8) *bh. s m t n g*=D A S + S D A. 8. Madanalalitá, (4 + 6 + 6) *m bh. n m n g*=2 S + 2 P I + S P I. 9. Pravaralalita, *y m n s r g*=I 2 S 2 P I T S. 10. Garuḍaruta, *n j bh. j t g*= 2 P 2 T P T S I. 11. S'ailaśikhá, (16 or 5+6+5) *bh. r n* 2·*bh. g*=D 2 T 3 A or D T + T P T + I A. 12. Varayuvatí, *bh r y* 2 *n g*=D 2 T S 2 P A. 13. Brahmarúpaka (double *Vidyunmálá*) 5 *m g*=8 S. 14. Achaladhṛiti, or *Gítyáryá*, 5 *n l*=8 P. 15. Pínanitambá, (4 + 5 + 7) *m t y m s g*=2 S + D S + S D S. 16. Yauvanamattá, (5 + 11) *bh.* 3 *m s g*=D S + 3 S D S.

XII. ATYASHṬI, 17×4=68.

1. S'ikhariṇí (6 + 11) *y m n s bh. l g* =I 2 S + 2 P I D I. 2. Pṛithwí, (8 + 9) *j s j s y l g*=I P 2 I + Tr. T S I. 3. Vansapatrapatita, or Vans'apatra, (10 + 7) *bh. r n bh. n l g*=D 2 T A + 2 P A. 4. Hariṇí, (6 + 4 + 7 or 4 + 6 + 7) *n s m r s l g*=2 P I + 2 S + I A I. 5. Mandákrántá, (4 + 6 + 7) *m bh. n* 2 *t* 2 *g*=2 S + 2 P I + C T S. 6. Narkuṭaka, or Nardaṭaka (7 + 10), or Avitatha (17†), *n j bh.* 2 *j l g*=Tr. 2 I + Tr. T I A. 7. Kokilaka, (7 + 6 + 4‡ or 8 + 5 + 4†) =Tr. 2 I + P I P + T I. 8. Hari, (6 + 4 + 7) 2 *n m r s l g*=3 P + 2 S + I A I. 9. Kántá, or Krántá, (4 + 6 + 7) *y bh. n r s l g*=I S + 2 P I + I A I. 10. Chitralekhá, or Atiśayaní, (10 + 7) 2 *s j bh. j* 2 *g*= 2 A 2 I + Tr. T S. 11. Máládhara, or Vanamáládhara, *n s j s y l g*=2 P 2 I Tr. T S I. 12. Háriṇí, (4 + 6 + 7) *m bh. n m y l g*=2 S + 2 P I + S B I.

XIII. DHṚITI, 18×4=72.

1. Kusumitalatávellitá, (5 + 6 + 7) *m t n* 3 *y*=M S + 2 P I + C T S. 2. Mahámáliká, Náràcha, Latá, Vanamálá, (10 + 8†) 2 *n* 4 *r*=3 P T S + I T S I. 3. Sudhá, (6 + 6 + 6) *y m n s t s*=I 2 S + 2 P I + S P I. 4. Hariṇapluta, (8 + 5 + 5) *m s* 2 *j bh. r* =S T 2 I + A I + A I. 5. Aśwagati, 5 *bh. s*=5 D A. 6. Chitralekhá, (4 + 7 + 7) *m* 2 *n* 2 *t m*=S T + P Tr. S + I T M. 7. Bhramarapada, *bh. r* 3 *n m*=D 2 T 3 P A S. 8. S'árdúlalalita, (12 + 6) *m s j s t s*=S D 2 T A + S P I. 9. S'árdúla, (12 + 6) *m s j s r m* =S D 2 T A + T 2 S. 10. Kesara, (4 + 7 + 7) *m bh. n y* 2 *r*=2 S + 2 P A + S I C. 11. Nandana, (11 + 7) *n j bh. j* 2 *r*=2 P T D I + 2 I C. [163] 12. Chitraśálá, Chitralekhá, (4 + 7 + 7) *m bh. n* 3 *y*=2 S + 2 P A + C T S. 13. Chala, (4 + 7 + 7) *m bh. n j bh. r*=2 S + 2 P A + I A I. 14. Vibudhapriya, (8 + 10†) *r s* 2 *j bh. r*=2 T 2 I + P 2 T 2 I. 15. Manjíra, 2 *m bh. m s m*= 3 S D S D 2 S. 16. Kríḍáchandra, 6 *y*=I T P I T P I T P.[1] 17. Charcharí, *r s* 2 *j bh. r*=T D I D 2 T 2 I.

XIV. ATIDHṚITI, 19×4=76.

1. S'árdúlavikríḍita, or S'árdúla, (12 + 7) *m s j s* 2 *t g*=S D 2 T A + S I C. 2. Meghavisphúrjita, or Vismita, (6 + 6 + 7) *y m n s* 2 *r g*=I 2 S + 2 P I + C T S. 2. Panchachámara, 2 *n* + alternate *g l*= Tr. P 7 I. 4. Pushpadáma, (5 + 7 + 7) *m t n s* 2 *r g*=M S + 2 P A + C T S. 5. Bimbá, (5 + 7 + 7) *m t n s* 2 *t g*=M S + 2 P A + H S I. 6. Chháyá, (6 + 6 + 7 or 12 + 7) *y m n s bh. t g*=I 2 S + 2 P I + D S I. 7. Makarandiká, (6 + 6 + 7) *y m n s* 2 *j g*=I 2 S + 2 P I + I A I. 8. Samudrataṭa, (8 + 4 + 7) *j s j s t bh. g*=I P 2 I + P I + S I A. 9. Surasá, (7 + 7 + 5) *m r bh. n y n g*=M T S + 2 P A + D I. 10. Maṇimanjarí, *y bh. n y* 2 *j g*=I S 2 P A 2 T 2 I. 11. Chandramálá, or Chandra, (10 + 9) 3 *n j* 2 *n l* =5 P + D 3 P. 12. Dhavalánka, or Dhavala, 6 *n g*=8 P A. 13. Sambhu,[2] (7 + 6 + 6) *s t y bh.* 2 *m g*=A S A S A 3 S.

XV. KṚITI, 20×4=80.

1. Suvadaná, (7 + 7 + 6) *m r bh. n y bh. l g*=2 S B + 2 P A + S P I.

[1] [This should be I T S I T S I T S.]

[2] [S'ambhu?]

2. Vṛitta, or Gaṇḍaka, *r j r j r j g l* =10 T. 3. S'obhá, (6 + 7 + 7) *y m* 2 *n* 2 *t* 2 *g*=I 2 S + 2 P A + T S B. 4. Gítiká, or Gítá, *s* 2 *j bh. r s l g*=A I P 2 T 2 I A I.

XVI. PRAKṚITI, 21×4=84.

1. Sragdhará, (7 + 7 + 7) *m r bh. n* 3 *y*=2 S B + 2 P A + T S B. 2. Salilanidhi, Sarasí, Siddhaka, S'asívadana, or Dhṛitas'rí, *n j bh.* 3 *j r*=2 P T D I + 2 A 2 I. 3. Narendra, *bh. r* 2 *n* 2 *j y*=D 2 T 3 P 2 D S.

XVII. A'KṚITI, 22×4=88.

1. Bhadraka, (10 + 12) *bh. r n r n r n g*=D 2 T A + I Tr. 2 T A. 2. Madirá, or Lalitá, 7 *bh. g*=6 D T I. 3. Hansí, (8 + 14) 2 *m* 2 *g* 4 *n* 2 *g*=4 S + 6 P S.

XVIII. VIKṚITI, 23×4=92.

1. As'walalita, or Adritanayá, (11 + 12) *n j bh. j bh. j bh. l g*=2 P T D I + I Tr. T D I. 2. Mattákríḍá, or Vájiváhana, (8 + 15) 2 *m t* 4 *n l g*= 4 S + 6 P A. 3. Sundarí, (7 + 6 + 10) 2 *s bh. s t* 2 *j*=A P S + 2 P S + 2 D.[1] 4. Málatí, or Madamattá, 7 *bh.* 2 *g*=7 D S. 5. Chitrapada, 7 *bh. l g* =7 D I. 6. Malliká, 7 *j l g*=I P T I P T I P T I A.

XIX. SANKṚITI, 24×4=96.

1. Tanwí, (5 + 7 + 12 or 12 + 12). *bh. t n s* 2 *bh. n y*=D S + 2 P A + 2 D 2 P S. 2. Durmilá, 8 *s*=8 A. 3. Kiríta, 8 *bh.*=8 D. 4. Jánakí, 8 *r*= T S I T S I T S I T S I. 5. Mádhaviká, 7 *j y* = I P T I P T I P T I P S.

[164] XX. ATIKṚITI, 25×4=100.

1. Kraunchapadá, (5 + 5 + 8 + 7) *bh. m s bh.* 4 *n g* = D S + D S + 4 P + 2 P A. 2. S'ambhu, 8 *m g*= 11 S M.

XXI. UTKṚITI, 26×4=104.

1. Bhujangavijṛimbhita, (8 + 11 + 7) 2 *m t* 3 *n r s l g*=4 S + 4 P A + I A I. 2. Apaváha, (9 + 6 + 6 + 5) *m* 6 *n s* 2 *g*=S D 2 P + 3 P + 3 P + A. S. 3. Gaurí, 8 *m* 2 *g*=13 S.

From 27 to 999 syllables in the verse.

Daṇḍaka, 27×4=108 to 999×4=3996.

1. Chaṇḍavṛishṭiprayáta, 2 *n* 7 *r*=2 Tr. 7 C.

2. Prachita, 2 *n* 8 etc. *r*.

325 species from 9 to 333 feet, viz. 2nd Arṇá, 2 *n* 8 *r*. 3rd Arṇava, 2 *n* 9 *r*. 4th Vyála, 2 *n* 10 *r*. 5th Jímúta, 2 *n* 11 *r* etc.

Or 3. Prachita, 2 *n* 7 etc. *y*=2 Tr. 7 etc. B.

4. Mattamátangalíláкara, 9 etc. *r*=9 etc. C.

5. Sinhavikránta, 2 *n* 10 etc. *r*.

6. Kusumastavaka, 9 etc. *s*=9 etc. A.

7. Anangas'ekhara, *l g l g* etc.=15 etc. I.

8. As'okamanjarí, *r j* etc.=15 etc. T.

Also Sálúra, 2 *g* 8 *n s*=S 12 P A.

VI.—*Half equal Metre; the stanza being composed of equal and similar couplets; but the couplets, of dissimilar verses.*

1. Upachitra, (*Upajáti* + *Támarasa*) 1st verse 3 *s l g* =3 A I. 2nd 3 *bh.* 2 *g*=3 D S.

2. Drutamadhyá, (*Dodhaka* + *Támarasa*). 1st 3 *bh.* 2 *g*=3 D S. 2nd *n* 2 *j y*=2 P 2 D S.

[1] [There seems some error here.]

3. Vegavatí, (*Upachitra*—penult Br. in 1st verse). 1st 3 *s g*=2 A P S. 2nd 3 *bh.* 2 *g*=3 D S.

4. Bhadravirâj (species of *Aupachhandasika*), 1st *t j r g*=S P 2 T S. 2nd *m s j* 2 *g*=S D 2 T S.

5. Ketumatí, 1st *s j s g*=A I Tr. S. 2nd *bh. r n* 2 *g*=T. 2 I Tr. S.

6. A'khyánakí (*Upajáti* viz. alternate *Indravajra* and *Upendravajra; some* say one verse *Indravajra*, three *Upendravajra*), 1st (and 3rd) 2 *t j* 2 *g*=S I D T S. 2nd (and 4th, some say 3rd) *j t j* + 2 *g* = 2 I D T S.

7. Viparítákhyánakí (*the converse of the preceding*), 1st *j t j* 2 *g*=2 I D T S. 2nd 2 *t j* 2 *g*=S I D T S.

8. Hariṇaplutá (*Drutavilambita*—one syllable), 1st 3 *s l g*=3 A I. 2nd *n* 2 *bh. r*=P I 2 A I.

9. Aparavaktra (species of *Vaitáliya* or *Bhadriká* + *Málatí*), 1st 2 *n r l g* =2 P A 2 I. 2nd *n* 2 *j r* = P 2 A 2 I.

10. Pushpitágrá (species of [165] *Aupachhandasika*), 1st 2 *n r y*=3 P 2 T S. 2nd *n* 2 *j r g*=2 P D 2 T S.

11. Yavamatí, 1st *r j r j*=6 T. 2nd *j r j r g*=5 I B.

12. S'ikhá, 1st 28 *l g*=7 Tr. I. 2nd 30 *l g*=7 Tr. P I.[1]

13. Khanjá, 1st 30 *l g*=7 Tr. P. 2nd 28 *l g*=7 Tr. I.[2]

14. Lalitá, 1st *r s l g*=2 T 2 I. 2nd *s n j g*=A Tr. 2 I.

15. Kaumudí (*Bhadriká* + *Chanchaláksħiká*), 1st 2 *n r l g*=Tr. P 3 I. 2nd 2 *n* 2 *r*=3 P T S I.

16. Manjusaurabha (*Málatí* + *Manjubhásħiṇí*), 1st *n* 2 *j r*=2 P T 3 I. 2nd *s j s j g*=A I P 3 I.

VII.—*Unequal Metre; the stanzas being composed of dissimilar verses.*

1. Udgatá, 1st verse *s j s l*=A I Tr. T. 2nd *n s j g*=Tr. A 2 I. 3rd *bh. n j l g*=T Tr. 2 A. 4th *s j s j g* = A I P 3 I.
2 varieties: viz. *Saurabhaka*, 3rd verse, *r n bh. g*=T D 2 A.[3] *Lalita*, 3rd verse 2 *n* 2 *s*=2 Tr. 2 A.

2. Upasthitaprachupita, 1st verse *m s j bh.* 2 *g*=S D 2 T D S. 2nd *s n j r g*=A 2 P 2 T S. 3rd 2 *n s*=3 P A. 4th 3 *n j y*=5 P D S. 2 varieties: viz. *Vardhamána*, 3rd verse 2 *n s* 2 *n s* =3 P A 3 P A; *S'uddhavirálṛishabha*, 3rd verse *t j r*=S A 2 I.

3. Padachaturúrdhwa, increasing in arithmetical progression from 8 to 20 syll. viz. 1st verse 8; 2nd 12; 3rd 16; 4th 20.
6 species: viz, *Ápíḍa*, End in S. Rest Br. *Pratyápíḍa*, Begin with S. or begin and end with S. *Manjarí*, or *Kaliká*, 1st and 2nd verses transposed 12 + 8 + 16 + 20. *Lavalí*, 1st and 3rd transposed 16 + 12 + 8 + 20. *Amṛitadhárá*, 1st and 4th transposed 20 + 12 + 16 + 8.

VIII.—*Supplement, under the denomination of Gáthá.*

1. Stanzas comprising four unequal verses, constituting a metre not described by writers on prosody.

2. Stanzas comprising more or fewer verses than four; viz. three, five, six, etc.

3. Any metre not specified by Pingala.

4. Metre not specified by any writer on prosody.

[1] [= 9 Tr. I, and 9 Tr. P I?]

[2] [= 9 Tr. P I. and 9 Tr. I.]

[3] [T D I A?]

V.

INTRODUCTORY REMARKS,

PREFIXED TO THE EDITION OF THE HITOPADEŚA,

Published at *Calcutta*, 1804. 4to.

[163] To promote and facilitate the study of the ancient and learned language of India, in the College of Fort William, it has been judged requisite to print a few short and easy compositions in the original Sanskrit. The first work chosen for this purpose, and inserted in the present volume, under its title of Hitopadeśa, or 'Salutary Instruction,' had been translated by Mr. Wilkins, and by the late Sir William Jones, as the text of a very ancient collection of apologues, familiarly known, in the numerous versions of it, under the name of 'Fables of Pilpay.' The great advantage, which may be derived by students, from consulting correct translations, at their first acquaintance with Sanskrit literature, has indicated this work as the fittest for selection; although it be not strictly the original text, from which those beautiful and celebrated apologues were transferred into the languages of Persia, and of the West.

In the concluding line of the poetical preface to the Hitopadeśa, it is expressly declared to have been drawn from the Panchatantra and other writings.[1] The book, thus mentioned as the chief source, from which that collection of

[1] [For a full account of the Panchatantra and the literature connected with it see Prof. Benfey's Introduction to his translation, Leipzig, 1859. Cf. also the analytical account of the Panchatantra, in Prof. Wilson's *Essays*, vol. iv., pp. 1-80, with pp. 139-144. A large part of the apologues appears to be of Buddhist origin.]

fables was taken, is divided into five chapters, as its name imports: it consists, like the Hitopadeśa, of apologues, recited by a learned Bráhman named Vishṇu-śarman, for the instruction of his pupils, the sons of an Indian [167] monarch; but it contains a greater variety of fables, and a more copious dialogue, than the work, which has been chiefly compiled from it; and, on comparison with the Persian translations now extant, it is found to agree with them more nearly, than that compilation, both in the order and the manner in which the tales are related.

To compare them, it has been first necessary to exclude all the additions, which have been made by translators. These have been explained by Abú'lfazl, with the history of the publication itself, in the preface to his own version, entitled 'Iyári-dánish; and by Husain Wá'iz, in the introduction to the Anwári Suhailí.

They recite from Abú'lmála's[1] preface to his translation of the Kalílah wa Dimnah, that Barzúyah, an eminent and learned physician, being purposely sent into Hindustán by Núshírván, king of Persia, brought a transcript of this with other books, which were preserved among the best guarded treasures of the kings of India: and it was immediately translated into Pahlaví, for the gratification of the Persian monarch, under the superintendence of his minister Buzurchumihr.

From this version in Pahlaví, by Buzurchumihr, or by Barzúyah (and which is said to have borne the title of Humáyún-námah, Jáwidán-khirad, and testament of Húshank), the book was translated into the Arabic language by Imám Abú'lhasan 'Abdullah Benu'l Mukaffa', in obedience to the commands of Abú'lja'far Mansúr, second *khalif* of the house of 'Abbás. From Arabic, it was restored into Persian, by direction of Abú'l Hasan Nasru'ddín Ahmad, a prince of the race of Sámán; and was clothed in verse by the poet Rúdakí, for Sultán Mahmúd Sabaktagín. It was again

[1] [Abú'l Ma'álí?]

translated into prose, from the Arabic of 'Abdu'llah, by desire of Abú'lmuzaffar Bahrám Sháh,[1] son of Sultán Mas'úd, a de[168]scendant of Sultán Mahmúd of Ghaznin; and this version, the author of which was Abú'lmála Nasrullah, is the same which has been since current under the title of Kalílah wa Dimnah. It underwent a revision, and received the embellishment of flowery language from Husain Wá'iz Káshafí, at the suggestion of Amír Shaikh Ahmad, surnamed Suhailí, a chieftain commanding under Sultán Husain Mírzá, of the house of Taimúr; and this highly polished version is named from the author's patron Anwári Suhailí. It was lastly revised, and put into plainer, but elegant language, by Abú'lfazl, in obedience to the orders of the Emperor Akbar.

This amended translation comprises sixteen chapters; ten of which, as Abú'lfazl states in his preface, were taken from the Hindí original entitled Karatak and Damanak; and six were added by Buzurchumihr, namely, the four last, containing stories recited by the Bráhman Bídpái, in answer to the questions of the King Dábishlím; and the two first, consisting of a preface by Buzurchumihr, with an introduction by Barzúyah. Both these introductory chapters had been omitted by Husain Wá'iz, as foreign to the original work: but he substituted a different beginning, and made other additions, some of which are indicated by him, and the rest are pointed out by Abú'lfazl; who has nevertheless retained them, as appendages not devoid of use, and therefore admissible in a composition intended solely to convey moral instruction. The whole of the dramatic part, including all the dialogue between Dábishlím, king of India, and Bídpái or Pílpái, a Bráhman of Sarandíp, as well as the finding of Húshank's legacy (from both which the work itself has derived two of the names, by which it has been most frequently distinguished), appears to have been added by the translators, although the appellations of the king, and of [169] the philosopher, are stated to be of Indian

[1] [Farishta calls him Mu'izz-ud-dín Bahrám Sháh.]

origin.[1] For Abú'lfazl has inserted the story at the close of the second chapter; after expressly declaring, in one place, that the substance of the work begins with the third; and in another, that the two first were added by the author of the Pahlaví translation.

Setting apart then the dramatic introduction, in which the Persian differs from both the Panchatantra and the Hitopadeśa, and beginning the comparison from the third chapter of the Kalílah wa Dimnah, it is found, that the fable of the ox[2] and lion, with all the subsequent dialogue between the shakals Karaṭaka and Damanaka, constituting the first chapter of the Panchatantra, corresponds with the Persian imitation; excepting, however, a few transpositions, and the omission of some apologues, as well as the insertion of others.

Thus the fable of 'The Ape and the Carpenter's Wedge,' which is first in both works, is immediately followed, in the Panchatantra, by that of 'The Shakal and the Drum'; but the Persian translators have here introduced a different apologue. They have placed the story of 'The Thief and the Mendicant,' with others included in it, immediately after [170] that of 'The Fox and the Drum'; but the Panchatantra interposes another tale, the omission of which, however, induces no imputation on the good taste of the translators. They have next substituted two fables ('The Sparrow, the Hawk, and the Sea,' and 'The Reformed Tyrant,') for a story of a wheelwright's marriage with a king's daughter.

The next three fables are alike in the Sanskrit and Persian;

[1] Husain Wá'iz and Abú'lfazl explain Bídpái, as equivalent to the Persian term *Hakím-mihrbán*; and, according to the ingenious conjecture of Sir William Jones, that appellation is corrupted from the Sanskrit *Vaidya-priya*. The name of Dábishlím, interpreted *Pádsháh-buzurg*, or great King, has not so striking a resemblance to any Sanskrit term of the same signification. *Pílpái* appears to be Persian; and in some copies of the Anwári Suhailí (for the passage is wanting in others), it is mentioned to have been translated from the Hindí *Hastipát*; which, in Sanskrit, bears the same meaning, viz. elephant's foot.

[2] The Persian name, *Shanzabah* (for so the word should be read, and not, as written in many copies, *Shutarbah*), is evidently formed on the Sanskrit name for this ox, *Sanjívaka*.

but two, which follow (*viz.* 'The Louse and the Bug,' and 'The Blue Shakal,') are omitted by the translators; who have evinced their judgment in the rejection of the first.

The fable of 'The Three Fish' is placed next by the Persian authors, and is followed by five others, which do not occur in the Panchatantra. These are succeeded by three more, which are placed by the Sanskrit author immediately after the fable of 'The Blue Shakal,' and before that of 'The Three Fish.'

Here the Panchatantra introduces a story of an elephant, whose death was procured though the means of a gad-fly, by birds whom he had aggrieved. But it has been omitted in the Persian, and so has the next fable, of 'The Lion and the Leopard.'

The remaining apologues, belonging to the first chapter, are alike in both works; excepting that of 'The Gardener, the Bear, and the Fly,' which is inserted last but one, in the Persian translation; but which does not occur in the Panchatantra.

Many of these fables are also found in the Hitopadeśa, but arranged in quite a different order, being interspersed with others, through the three last chapters of that compilation.

Without further particularizing the variations of the Persian from the Sanskrit, it may be sufficient to say, that the five chapters of the Panchatantra agree, in the subject, and in the general arrangement of the fables, with the third, fifth, sixth, seventh, eighth, and ninth chapters of the 'Iyári-[171] dánish; and that more than half of the fables, contained in that part of the Persian work, which purports to have been derived from the Indian text, corresponds exactly to similar apologues in the Sanskrit. In most instances of omission, a reason may be easily conjectured for the rejection of the original stories: and those, which have been substituted for them, as well as the few contained in the remaining chapters, which are not avowedly additional, may have been taken by the first translator, either from other Indian works, (for

Barzúyah is stated to have brought more than one book from Hindustán,) or, though not acknowledged by him, may have been drawn from different sources. It probably was more his design to present to the King of Persia a pleasing collection of apologues, than a strictly faithful translation of a single Indian work.

This collection of fables has been translated more frequently, and into a greater variety of languages, than any other composition not sacred; and, although the earliest paraphrase, in Pahlaví, be now lost, its Arabic version is extant, or lately was so;[1] and may be easily verified through the translations made into more than one language, upon the Arabic text.

It is unnecessary to speak of another Arabic version, said to have been taken from the original text of a pretended king of India named Isam, three hundred years before the time of Alexander; or to mention that made from the testament of Húshank (entitled Jáwidán-khirad), by Hasan, son of Suhail, Minister of al Mámún, the seventh *khalif* of the 'Abbásí dynasty. For both these pretended versions are probably the same with 'Abdu'llah's, but erroneously ascribed to other authors.

From his Arabic text, a Greek translation, entitled Stephanites and Ichnelates, was completed, seven hundred years ago, by Simeo Sethus, for the Emperor Alexius [172] Comnenus. One in Syriac, under the title of Calaileg and Damnag, is probably taken from the Arabic, though purporting to be derived immediately from the Indian text.[2] The Turkish versions (for there are more than one) have been derived mediately or immediately from the Arabic; and several Latin and Italian translations have been drawn from the Greek of Sethus; not to mention another Latin one from the Hebrew, nor the

[1] [This was edited by De Sacy in 1816. Its title is the Kalílah wa Dimnah of 'Abdullah ben ul Mukaffa'.]

[2] [A MS. of this translation from the Pahlaví was found in 1870 by Dr. Socin in the episcopal library at Máridín.]

German and Spanish versions from the Latin and the Italian. All these, as well as the French translations of Gaulmin, David Said, Galland and Cardonne, from the Persian Kalílah wa Dimnah, and from the Turkish Humáyún-námah and Anwári Suhailí, as also the English version from the French, appear to have been compared with considerable attention by various persons: but, excepting two unfaithful imitations in Latin and Italian, the general correspondence of the rest seems to be acknowledged.[1]

We may conclude, therefore, that the Persian Kalílah wa Dimnah, and 'Iyári-dánish, exhibit a sufficiently exact representation of the Arabic translation from the Pahlaví; and that, after rejecting avowed additions, we ought to find there a near resemblance to the Indian original. From a careful collation of both Sanskrit works with the genuine parts of the Persian translation, it is evident, as has been already shown, that the Panchatantra corresponds best with them: and there can be little hesitation in pronouncing this to be the original text of the work, which was procured from India by Núshírván more than twelve hundred years ago.

[173] This fact is not without importance in the general history of Indian literature; since it may serve to establish the greater antiquity of authors who are quoted in the Panchatantra; and amongst others, that of the celebrated astrologer Varáha Mihira, who is cited by name in one passage of the first chapter.[2]

The Hitopadeśa, containing nearly the same fables told more concisely and in a different order, has been translated

[1] See Bibliotheca Græca of Fabricius, vol. vi. p. 460, and vol. x. p. 324; Bibliothèque Orientale of D'Herbelot, pp. 118, 206, 245, 399, and 456; Works of Sir W. Jones, vol. vi. p. 4; and As. Res. vol. i. p. 429; also Wilkins's Heetopades, preface, p. xiii.

[2] [The various MSS., however, so continually differ, by the alterations and additions of successive transcribers, that we can feel no confidence in the minuter details of our present text. The MSS. of the Arabic version differ in the same way, see Benfey, pp. 5-8.]

into Persian, in comparatively recent times, by Maulaví Táju'ddín, who entitled it Mufarrihu'lkulúb; and who does not appear, from his preface, to have been aware, that the work, translated by him, was any way connected with the Kalílah wa Dimnah.

This, as well as the Hindí version of it, by Mír Bahádur 'Alí, which has been printed for the use of the College of Fort William, and which is entitled Akhláki Hindí, may afford some help to a student, reading the Hitopadeśa, for his first exercise in the Sanskrit language. He will find still more effectual assistance in the English translations by Sir William Jones and Mr. Wilkins: and, for this advantage, no less than for its easy style, the Hitopadeśa has the first place in the present collection of Sanskrit works.

The second place in it has been allotted to a short story in verse, which is abridged from a celebrated poem of Daṇḍí's. This distinguished poet, famous above all other Indian bards for the sweetness of his language, and therefore ranked by Kálidása himself (if tradition may be credited) next to the fathers of Indian poetry, Válmíki and Vyása, composed a pleasing story in harmonious verse,[1] under the title of Daśa-kumára-charita, or 'Adventures of the Ten Youths.' It is divided into two parts: the first comprising five chapters, and ending with the marriage of the principal hero; the other containing, through eight [174] more chapters, the adventures of the same prince and his nine companions.[2] The first part has been abridged by more than one author; among others, by Vináyaka in about two hundred couplets collected into three sections; and by Apyayya, in as many sections, and nearly the same number of couplets. This abridgment, being composed in easy, correct, and smooth language, is preferable to the other, and has been selected for its merits in those respects;

[1] Cf. p. [134].

[2] [For fuller details see Professor Wilson's Introduction to his edition, and his Analysis, Essays, iv., pp. 160-289.]

though the story be told with too great conciseness to preserve much interest.

Concerning the author of this epitome, or argument, of Daṇḍí's poem, no information has been yet obtained. He calls himself a counsellor and minister, and was probably in the service of some Hindu Rájá.[1]

The present volume ends with three Śatakas or centuries of verses by Bhartṛihari. They were recommended for selection, partly by their prevailing moral tendency, though some passages be far from unexceptionable; and partly as a fit specimen of polished Sanskrit verse. The poetical beauties, which are most admired by the Hindu learned, and which are inculcated by their writers on rhetoric, are scattered in these couplets of Bhartṛihari, with a more sparing hand than in most of the laboured performances of Indian poets: and, from this cause, his poetry is less obscure than theirs.

These Śatakas are ascribed by the unanimous consent of the learned, to Bhartṛihari, the brother of Vikramáditya. He is also the reputed author of a grammatical treatise. It is possible, perhaps it might be said probable, that these may have been composed by a different person in his name. But it is clear from the first couplet of the Níti-śataka, that they have been written either in the real, or in the assumed character of Bhartṛi[175]hari, since that couplet alludes to a circumstance conspicuous in the traditional story of his life.

The authentic history of Bhartṛihari is too intimately blended with that of ancient India, and involves questions of too great intricacy, to be stated, or discussed, in this preface. It remains only to say a few words respecting the present edition of the three works which have been here mentioned.

The editor, Mr. Carey, undertook the publication, on a

[1] [Daṇḍin has usually been placed in the reign of Bhoja of Dhárá or soon afterwards; but Prof. Weber, *Ind. Streifen*, i. 312, thinks that his style shows that he must have preceded Báṇa, and consequently he may have lived in the 6th century. He also often speaks of Buddhists, and mentions the Muhammadans (*Yavanas*) as traders, not conquerors.]

suggestion from the Council of the College of Fort William, and under the patronage of Government. He has, at the same time, risked a larger edition than was required for the College, in the expectation of encouragement from the public.

In printing the Hitopadeśa, six manuscript copies were collated. They were found to differ much, in the quotation of whole passages, as well as in the reading of single words. Either the reading most suitable to the context, or that which was found in the greatest number of copies, has been selected, according as circumstances have dictated the propriety of following one rule or the other.

The abridgment of the Daśa Kumára has been printed from a single copy: and the Śatakas of Bhartṛihari, from three manuscripts; every one of which was incomplete: but the deficiencies did not occur in the same places.

With the last Śataka, the style of which is, in general, less clear than that of the preceding, the scholia have been printed. They will serve to make the reader acquainted with the manner of Sanskrit commentators: and owing to the peculiar difficulties of the language, the student will find it long necessary, and always useful, to consult the commentaries, while perusing Sanskrit compositions. To [176] lessen one of those difficulties, which arises from the frequent permutation of letters at the beginning and close of words, the editor has marked, by a dot under the syllable, places where the elision of a letter is found, or any other permutation, that is not obvious.

In this first attempt to employ the press in multiplying copies of Sanskrit books with the Devanágarí character, it will be no matter of surprise, nor any cause of imputation on the editor's diligence, that the table of corrections should be large. The whole volume has been been carefully examined by several Pandits; and there is reason to believe, that no error of consequence can have escaped their notice.

Calcutta, 17*th September*, 1804.

VI.

ENUMERATION OF INDIAN CLASSES.[1]

[From the *Asiatic Researches*, vol. v. pp. 53–67. *Calcutta*, 1798. 4to.]

[177] THE permanent separation of classes, with hereditary professions assigned to each, is among the most remarkable institutions of India; and, though now less rigidly maintained than heretofore, must still engage attention. On the subject of the mixed classes, Sanskrit authorities, in some instances, disagree: classes mentioned by one, are omitted by another; and texts differ on the professions assigned to some tribes. A comparison of several authorities, with a few observations on the subdivisions of classes, may tend to elucidate this subject, in which there is some intricacy.

One of the authorities I shall use is the Játimálá, or Garland of Classes; an extract from the Rudra-yámala-tantra, which in some instances corresponds better with usage, and received opinions, than the ordinances of Manu, and the great Dharma-puráṇa.[2] On more important points its authority could not be compared with the Dharmaśástra; but, on the subject of classes, it may be admitted; for the Tantras form a

[1] [For further details on the subject of the divisions of casts in the North-west of India, see Sir H. M. Elliot's *Races of the N.W. Provinces*, vol. i.]

[2] The texts are cited in the Vivádárṇava-setu, from the Vṛihad-dharma-puráṇa. This name I therefore retain; although I cannot learn that such a *puráṇa* exists, or to what treatise the quotation refers under that name. See vol. i. p. [103] of the present work.

branch of literature highly esteemed, though at present much neglected.[1] Their fabulous origin derives [178] them from revelations of Śiva to Párvatí, confirmed by Vishṇu, and therefore called Ágama, from the initials of three words in a verse of the Toḍala-tantra.

"Coming from the mouth of Śiva, heard by the mountain-born goddess, admitted by the son of Vasudeva, it is thence called Ágama."

Thirty-six are mentioned for the number of mixed classes; but, according to some opinions, that number includes the fourth original tribe, or all the original tribes, according to other authorities: yet the text quoted from the great Dharma-puráṇa, in the digest of which a version was translated by Mr. Halhed, names thirty-nine mixed classes; and the Játi-málá gives distinct names for a greater number.

On the four original tribes it may suffice, in this place, to quote the Játimálá, where the distinction of Bráhmaṇas, according to the ten countries to which their ancestors belonged, is noticed: that distinction is still maintained.

"In the first creation by Brahmá, Bráhmaṇas proceeded, with the Veda, from the mouth of Brahmá. From his arms Kshatriyas sprung; so from his thigh, Vaiśyas: from his foot Śúdras were produced: all with their females.

"The Lord of creation viewing them said, 'What shall be your occupations?' They replied, 'We are not our own masters, O God! command us what to undertake.'

"Viewing and comparing their labours, he made the first tribe superior over the rest. As the first had great inclination for the divine sciences, (*Bráhma-veda,*) therefore he was Bráhmaṇa. The protector from ill (*kshayate*) was Kshatriya. Him whose profession (*veśa*) consists in commerce, which promotes the success of wars, for the protection of himself and of mankind, and in husbandry, and attendance on cattle, he called Vaiśya. The other should voluntarily serve the

[1] See vol. i. p. [199] of the present work.

three tribes, and therefore [179] he became a Śúdra: he should humble himself at their feet."

And in another place:

"A chief of the twice-born tribe was brought by Vishṇu's eagle from Śáka-dwípa: thus have Śáka-dwípa Bráhmaṇas become known in Jambu-dwípa.

"In Jambu-dwípa, Bráhmaṇas are reckoned tenfold; Sáraswata, Kányakubja, Gauḍa, Maithila, Utkala, Drávida, Maháráshṭra, Tailanga, Gujjara, and Káśmíra, residing in the several countries whence they are named.[1]

"Their sons and grandsons are considered as Kányakubja priests, and so forth. Their posterity, descending from Manu, also inhabit the southern regions: others reside in Anga, Banga, and Kalinga; some in Kámarúpa and Oḍra. Others are inhabitants of Śumbhadeśa: and twice-born men, brought by former princes, have been established in Ráḍa, Mágadha, Varendra, Chola, Swarṇagráma, Chína, Kúla, Śáka, and Barbara."[2]

[1] These several countries are, Sáraswata, probably the region watered by the river Sersutty, as it is marked in maps; unless it be a part of Bengal, named from the branch of the Bhágírathí, which is distinguished by this appellation; Kányakubja or Kanoj; Gauḍa, probably the western Gár, and not the Gaur of Bengal;[1] Mithila, or Tírabhukti, corrupted into Tirhut; Utkala, said to be situated near the celebrated temple of Jagannátha; Dráviḍa, pronounced Drávira, possibly the country described by that name, as a maritime region south of Karṇáṭa,[2] (As. Res. vol. ii. p. 117); Maháráshṭra, or Mahráṭṭa; Telinga, or Telingána; Gujjara, or Guzrat; Káśmíra, or Cashmir.

[2] Anga includes Bhágalpur. Banga, or Bengal proper, is a part only of the Súba. Varendra, the tract of inundation north of the Ganges, is a part of the present Zila of Rájasháhí. Kalinga is watered by the Godávarí (As. Res. vol. iii. p. 48). Kámarúpa, an ancient empire, is become a province of Asám. Oḍra I understand to be Orissa Proper. Ráḍa (if that be the true reading) is well known as the country west of the Bhágírathí. Mágadha, or Magadha, is Bihár Proper. Chola is part of Bírbhúm. Another region of this name is mentioned in the Asiatic Researches, vol. iii. p. 48. Swarṇagráma, vulgarly Sunargau,[3] is situated east of Dacca. Chína is a portion of the present Chinese empire. On the rest I can offer no conjecture. S'áka and Barbara, here mentioned, must differ from the Dwípa, and the region situated between the Kus'a and S'ankha dwípas.

[1] [See note 1 at page 25 of the present volume.]

[2] [The Dravidas or Drávidas are undoubtedly the inhabitants of the Tamil country. In Sanskrit the country is generally spoken of by the name of its people in the plural.]

[3] [Sonágáṇ. It is commonly written Soonargong, see Hamilton's *Hindostan*, vol. i. p. 187.]

[180] I shall proceed, without further preface, to enumerate the principal mixed classes, which have sprung from intermarriages of the original tribes.

1. Múrdhábhishikta, from a Bráhmaṇa by a girl of the Kshatriya class; his duty is the teaching of military exercises. The same origin is ascribed in the great Dharma-puráṇa to the Kumbhakára,[1] or potter, and Tantraváya,[2] or weaver: but the Tantraváya, according to the Játimálá, sprung from two mixed classes; for he was begotten by a man of the Maṇibandha on a woman of the Maṇikára tribe.

2. Ambashṭha, or Vaidya,[3] whose profession is the science of medicine, was born of a Vaiśya woman, by a man of the sacerdotal class. The same origin is given by the Dharmapuráṇa to the Kansakára,[4] or brazier, and to the Śankhakára,[5] or worker in shells. These again are stated, in the *tantra*, as springing from the intermarriages of mixed classes; the Kansakára from the Támrakúta and the Śankhakára, also named Śankhadáraka, from the Rájaputra and Gándhika: for Rájaputra not only denotes Kshatriyas as sons of kings, but is also the name of a mixed class, and of a tribe of fabulous origin.

Rudra-yámala-tantra: "The origin of Rájaputras is from the Vaiśya on the daughter of an Ambashṭha. Again, thousands of others sprung from the *foreheads of cows* kept to supply oblations."

3. Nisháda, or Párasava, whose profession is catching fish, was born of a Śúdra woman by a man of a sacerdotal class. The name is given to the issue of a legal marriage [181] between a Bráhmaṇa and a woman of the Śúdra tribe. It should seem that the issue of other legal marriages in different ranks were described by the names of mixed classes springing from intercourse between the several tribes. This, however, is liable to some question; and since such marriages are con-

[1] Vulgarly, Kumár.
[2] Vulgarly, Tánti.
[3] Vulgarly, Baidya.
[4] Vulgarly, Kaserá [Kánsári].
[5] Vulgarly, Sakhera [Sánkhári].

sidered as illegal in the present age, it is not material to pursue the inquiry.

According to the Dharma-puráṇa, from the same origin with the Nisháda springs the Varájívi, or astrologer. In the *tantra* that origin is given to the Bráhma-śúdra, whose profession is to make chairs or stools used on some religious occasions. Under the name of Varájívi[1] is described a class springing from the Gopa and Tantraváya, and employed in cultivating betel. The profession of astrology, or, at least, that of making almanacks, is assigned, in the *tantra*, to degraded Bráhmaṇas.

"Bráhmaṇas, falling from their tribe, became kinsmen of the twice-born class: to them is assigned the profession of ascertaining the lunar and solar days."

4. Máhishya is a son of a Kshatriya by a woman of the Vaiśya tribe. His profession is music, astronomy, and attendance on cattle.

5. Ugra was born of a S'údra woman by a man of the military class. His profession, according to Manu, is killing or confining such animals as live in holes: but, according to the *tantra*, he is an encomiast or bard. The same origin is attributed to the Nápita[2] or barber; and to the Maudaka, or confectioner. In the *tantra*, the Nápita is said to be born of a Kuveriṇa woman by a man of the Paṭṭikára class.[3]

6. Karaṇa,[4] from a Vaiśya, by a woman of the S'údra [182] class, is an attendant on princes, or secretary. The appellation of Káyastha[5] is in general considered as synonymous with Karaṇa; and accordingly the Karaṇa tribe commonly assumes the name of Káyastha: but the Káyasthas of Bengal have pretensions to be considered as true S'údras, which the Játimálá seems to authorize; for the origin of the Káyastha is there mentioned, before the subject of mixed tribes is introduced, immediately after describing the Gopa as a true S'údra.

[1] Vulgarly, Baraiya [Bárui.]

[2] Vulgarly, Náya or Nái.

[3] [Or rather "by a Kuverin man of a Paṭṭikári woman."]

[4] Vulgarly, Karaṇ.

[5] Vulgarly, Káit.

One, named Bhútidatta, was noticed for his domestic assiduity;[1] therefore the rank of Káyastha was by Bráhmaṇas assigned to him. From him sprung three sons, Chitrángada, Chitrasena, and Chitragupta: they were employed in attendance on princes.

The Dharma-puráṇa assigns the same origin to the Támbúlí, or betel-seller, and to the Tanlika,[2] or areca-seller, as to the Karaṇa.

The six before enumerated are begotten in the direct order of the classes. Six are begotten in the inverse order.

7. Súta, begotten by a Kshatriya on a woman of the priestly class. His occupation is managing horses and driving cars. The same origin is given, in the *puráṇa*, to the Málákára[3] or florist; but he sprung from the Karmakára and Tailika classes, if the authority of the *tantra* prevails.

8. Mágadha, born of a Kshatriya girl, by a man of the commercial class, has, according to the *śástra*, the profession of travelling with merchandize; but, according to the *puráṇa* and *tantra*, is an encomiast. From parents of those [183] classes sprung the Gopa,[4] if the *puráṇa* may be believed; but the *tantra* describes the Gopa as a true S'údra, and names Gopajívi,[5] a mixed class, using the same profession, and springing from the Tantraváya and Máṇibandha tribes.

9 and 10. Vaideha and Ayogava. The occupation of the first, born of a Bráhmaṇí by a man of the commercial class, is waiting on women: the second, born of a Vaiśya woman by a man of the servile class, has the profession of a carpenter.

11. Kshattṛi, or Kshattá, sprung from a servile man by a woman of the military class, is employed in killing and confining such animals as live in holes. The same origin is ascribed by the *puráṇa* to the Karmakára, or smith, and Dása, or mariner. The one is mentioned in the *tantra* without

[1] Literally, Staying at home, (*káye sansthitaḥ*,) whence the etymology of Káyastha.

[2] [Támbúlika?]

[3] Máli.

[4] Gop.

[5] Goariá-Gop.

specifying the classes from which he sprung; and the other has a different origin, according to the *śástra* and *tantra*.

All authorities concur in deriving the Cháṇḍála from a S'údra father and Bráhmaṇí mother. His profession is carrying out corpses, and executing criminals; and officiating in other abject employments for the public service.

A third set of Indian classes originate from the intermarriages of the first and second set: a few only have been named by Manu; and, excepting the Abhíra, or milkman, they are not noticed by the other authorities to which I refer. But the *puráṇa* names other classes of this set.

A fourth set is derived from intercourse between the several classes of the second: of these also few have been named by Manu; and one only of the fifth set, springing from intermarriages of the second and third; and [184] another of the sixth set, derived from intercourse between classes of the second and fourth. Manu adds to these tribes four sons of outcasts.

The *tantra* enumerates many other classes, which must be placed in lower sets,[1] and ascribes a different origin to some of the tribes in the third and fourth sets. To pursue a verbose comparison would be tedious, and of little use; perhaps, of none; for I suspect that their origin is fanciful; and, except the mixed classes named by Manu, that the rest are terms for professions rather than tribes; and they should be considered as denoting companies of artisans, rather than distinct races. The mode in which Amara Sinha mentions the mixed classes and the professions of artisans, seems to support this conjecture.

However, the Játimálá expressly states the number of forty-two mixed classes, springing from the intercourse of a

[1] [The asterisk which appears at this place in the London edition had no note corresponding to it at the foot of the page. The note in the Asiatic Researches is as follows: "See the annexed rule, formed by our late venerable President." Sir W. Jones's rule was, however, omitted in the printing.]

man of inferior with a woman of superior class. Though, like other mixed classes, they are included under the general denomination of S'údra, they are considered as most abject, and most of them now experience the same contemptuous treatment as the abject mixed classes mentioned by Manu. According to the Rudra-yámala, the domestic priests of twenty of these tribes are degraded. "Avoid," says the *tantra*, "the touch of the Cháṇḍála, and other abject classes; and of those who eat the flesh of kine, often utter forbidden words, and perform none of the prescribed ceremonies; they are called Mlechha, and going to the region of Yavana, have been named Yávanas.

"These seven, the Rajaka, Karmakára, Naṭa, Baruḍa, Kaivarta, and Medabhilla,[1] are the last tribes. Whoever associates with them undoubtedly falls from his class; whoever bathes or drinks in wells or pools which they have caused to be made, must be purified by the five [185] productions of kine; whoever approaches their women, is doubtless degraded from his rank.

"For women of the Naṭa and Kapála classes, for prostitutes, and for women of the Rajaka and Nápita tribes, a man should willingly make oblations, but by no means dally with them."

I may here remark, that, according to the Rudra-yámala, the Naṭa and Naṭaka are distinct; but the professions are not discriminated in that *tantra*. If their distinct occupations, as dancers and actors, are accurately applied, dramas are of very early date.

The Puṇḍraka and Paṭṭasútrakára, or feeder of silk-worms, and silk-twister, deserve notice; for it has been said, that silk was the produce of China solely until the reign of the Greek Emperor Justinian, and that the laws of China jealously guarded the exclusive production. The frequent mention of silk in the most ancient Sanskrit books would not fully disprove that opinion; but the mention of an Indian class, whose

[1] [Rather the *Meda* and the *Bhilla*, see St. Petersb. Dict., sub. v.]

occupation it is to attend silk-worms, may be admitted as proof, if the antiquity of the *tantra* be not questioned. I am informed, that the *tantras* collectively are noticed in very ancient compositions; but, as they are very numerous, they must have been composed at different periods; and the *tantra* which I quote might be thought comparatively modern. However, it may be presumed that the Rudra-yámala is among the most authentic, and, by a natural inference, among the most ancient; since it is named in the Durgá-mahattwa where the principal *tantras* are enumerated.[1]

[186] In the comparative tables to which I have referred, the classes are named, with their origin, and the particular professions assigned to them. How far every person is bound, by original institutions, to adhere rigidly to the profession of his class, may merit some inquiry. Lawyers have largely discussed the texts of law concerning this subject, and some difference of opinion occurs in their writings. This, however, is not the place for entering into such disquisitions. I shall therefore briefly state what appears to be the best established opinion, as deduced from the texts of Manu, and other legal authorities.

The regular means of subsistence for a Bráhmaṇa, are assisting to sacrifice, teaching the Vedas, and receiving gifts; for a Kshatriya, bearing arms; for a Vaiśya, merchandize, attending on cattle, and agriculture; for a S'údra, servile attendance on the higher classes. The most commendable are, respectively for the four classes, teaching the Veda, defending

[1] Thus enumerated, "Kálí-tantra, Muṇḍamálá, Tárá, Nirváṇa-tantra, Sarvasáraṇ [?], Bíra-tantra, Lingárchana, Bhúta-tantra, Uddeśana and Káliká-kalpa, Bhairaví-tantra, and Bhairaví-kalpa, Toḍala, Mátṛibhedanaka, Máyá-tantra, Bíreśwara, Viśwasára, Samayá-tantra, Brahma-yámala-tantra, Rudra-yámala-tantra, S'anku-yámala-tantra, Gáyatrí-tantra, Kálikákula-sarvaswa, Kulárṇava, Yoginí-tantra, and the Tantra Mahishamardiní. These are here universally known, O Bhairaví, greatest of souls! And many are the *tantras* uttered by S'ambhu." [For some account of the Tantra literature, see Wilson's *Essays on the Religion of the Hindus*, vol. i. pp. 247-262, and Aufrecht's *Bodl. Cat.* pp. 88—110. I have corrected *Singárchana* to *Lingárchana.*]

the people, commerce, or keeping herds or flocks, and servile attendance on learned and virtuous priests.

A Bráhmaṇa, unable to subsist by his own duties, may live by those of a soldier: if he cannot get a subsistence by either of these employments, he may apply to tillage, and attendance on cattle, or gain a competence by traffic, avoiding certain commodities. A Kshatriya, in distress, may subsist by all these means; but he must not have recourse to the highest functions. In seasons of distress, a further latitude is given. The practice of medicine, and other learned professions, painting and other arts, work for wages, menial service, alms, and usury, are among the [187] modes of subsistence allowed to the Bráhmaṇa and Kshatriya. A Vaiśya, unable to subsist by his own duties, may descend to the servile acts of a S'údra. And a S'údra, not finding employment by waiting on men of the higher classes, may subsist by handicrafts; principally following those mechanical occupations, as joinery and masonry; and practical arts, as painting and writing; by following of which he may serve men of superior classes; and, although a man of a lower tribe is in general restricted from the acts of a higher class, the S'údra is expressly permitted to become a trader or a husbandman.

Besides the particular occupations assigned to each of the mixed classes, they have the alternative of following that profession which regularly belongs to the class from which they derive their origin on the mother's side: those, at least, have such an option, who are born in the direct order of the tribes, as the Múrdhábhishikta, Ambashṭha, and others. The mixed classes are also permitted to subsist by any of the duties of a S'údra; that is, by a menial service, by handicrafts, by commerce, or by agriculture.

Hence it appears that almost every occupation, though regularly it be the profession of a particular class, is open to most other tribes; and that the limitations, far from being rigorous, do, in fact, reserve only one peculiar profession, that

of the Bráhmaṇa, which consists in teaching the Veda, and officiating at religious ceremonies.

The classes are sufficiently numerous; but the subdivisions of them have further multiplied distinctions to an endless variety. The subordinate distinctions may be best exemplified from the Bráhmaṇa and Káyastha, because some of the appellations, by which the different races are distinguished, will be familiar to many readers.

The Bráhmaṇas of Bengal are descended from five priests, invited from Kányakubja, by Ádíśwara,[1] king of [188] Gauḍa, who is said to have reigned about nine hundred years after Christ. These were Bhaṭṭa Náráyaṇa, of the family of Saṇḍila, a son of Kaśyapa; Daksha, also a descendant of Kaśyapa; Vedagarva,[2] of the family of Vatsa; Chandra, of the family of Savarṇa, a son of Kaśyapa; and Śrí Harsha, a descendant of Bharadwája.[3]

From these ancestors have branched no fewer than a hundred and fifty-six families, of which the precedence was fixed by Ballála-sena, who reigned in the eleventh century of the Christian era. One hundred of these families settled in Várendra, and fifty-six in Ráḍhá. They are now dispersed throughout Bengal, but retain the family distinctions fixed by Ballála-sena. They are denominated from the families to

[1] [The name is commonly written A'diśúra or Ádisur. Bábú Rajendralála Mitra has the following remarks in his paper "On a Land Grant of Mahendrapála Deva," in the B.A.S. Journ. 1864:—"The Kulína Káyasthas have carefully preserved their genealogy. They hold periodical meetings (*ekajáyis*), at which all the family heralds or *ghaṭaks* assemble, and record the names of every successive generation. The last meeting of this kind was held several years ago at the house of Rája Rádhákánta Deva, when the names of the 24th generation of Kulínas were duly recorded. The writer of this note is himself one of the 24th in descent from Kálidása Mitra. In some families the 26th, the 27th, and even the 28th descent, have already appeared, but nowhere later." He takes the average at 27 generations, and fixes the date of the first advent of the Káyasthas into Bengal in 964 A.D. Lassen thinks that A'diśúra was a contemporary of S'rí Harsha, or S'íláditya, of Kanauj (A.D. 619–650).

[2] [Vedagarbha ?]

[3] [Cf. Pertsch, *Kshitiśavaṃśávalicharita*, pp. 2, 49. According to the authorities there quoted, Vedagarbha was of the Sávarṇa-gotra, and Chhándaḍa (*sic*) of the Vátsa. Cf. also Grill's pref. to his ed. of the Veṇí-saṃhára.]

which their five progenitors belonged, and are still considered as Kányakubja Bráhmaṇas.

At the period when these priests were invited by the king of Gauḍa, some Sáraswata Bráhmaṇas, and a few Vaidikas, resided in Bengal. Of the Bráhmaṇas of Sáraswata, none are now found in Bengal; but five families of Vaidikas are extant, and are admitted to intermarry with the Bráhmaṇas of Ráḍhá.

Among the Bráhmaṇas of Várendra, eight families have pre-eminence, and eight hold the second rank.[1] Among [189]
those of Ráḍhá, six hold the first rank.[2] The distinctive appellations of the several families are borne by those of the first rank; but in most of the other families they are disused; and *śarman*, or *śarmá*, the addition common to the whole tribe of Bráhmaṇas, is assumed. For this practice, the priests of Bengal are censured by the Bráhmaṇas of Mithilá, and other countries, where that title is only used on important occasions, and in religious ceremonies.

In Mithilá the additions are fewer, though distinct families are more numerous; no more than three surnames are in use in that district, Ṭhákura, Miśra, and Ojhá; each *appropriated* to many families.

[1] VÁRENDRA BRÁHMAṆAS.

KULÍNA 8.

Maitra.	*Bhíma*, or *Káli.*	*Rudra-Vágíśí.*	*Sanyamini*, or *Sanḍyál.*
Láhari [Lahiḍí].	*Bháduri.*	*Sádhu-Vágíśí.*	*Bhadara* [Bháḍaḍa].

The last was admitted by election of the other seven.

S'UDDHA-S'ROTRIYA 8.

KASHṬA-S'ROTRIYA 84.

The names of these 92 families seldom occur in common intercourse.

[2] RÁḌHÍYA BRÁHMAṆAS.

KULÍNA 6.

Mukhuti, vulgarly, *Mukhurja.**	*Gánguli.*	*Kánjalála.*
Ghoshála.	*Bandyagati*, vulgarly, *Banoji.**	*Chaṭati*, vulgarly, *Chaṭoji.**

S'ROTRIYA 50.

The names of these 50 families seldom occur in common intercourse.

* [These names are properly *Mukhopádhyáya*, *Bandyopádhyáya*, and *Chaṭṭopádhyáya*.]

The Káyasthas of Bengal claim descent from five Káyasthas who attended the priests invited from Kányakubja.[1] Their descendants branched into eighty-three families; and their precedence was fixed by the same prince Ballála-sena, who also adjusted the family rank of other classes.

In Banga and Dakshiṇa Ráḍhá, three families of Káyasthas have pre-eminence; eight hold the second rank.[2] The [190] Káyasthas of inferior rank generally assume the addition of Dása, common to the tribe of S'údras, in the same manner as other classes have similar titles common to the whole tribe. The regular addition to the name of a Kshatriya is Varman; to that of a Vaiśya, Gupta; but the general title of Deva is commonly assumed; and, with a feminine termination, is also borne by women of other tribes.[3]

[1] [Their names were Makaranda Ghosha, Daśaratha Basu, Kálidása Mitra, Daśaratha or Viráṭa Guha, and Purushottama Datta. The first three acknowledged service to the Brahmans, and their descendants were therefore ranked as *kulína* (noble). The Kulínas and the Sanmaulikas intermarry. But the inferior Káyastha families, the Maulikas (more commonly called Báhátture from the Bengali word for 72), may not intermarry with their superiors.]

[2] KÁYASTHAS of DAKSHIṆA RÁḌHÁ and BANGA.

KULÍNA 3.

Ghosha	*Vasu*, vulg. *Bose.*	*Mitra.*

SANMAULIKA 8.

De.	*Datta.*	*Kara.*	*Pálita.*
Sena.	*Sinha.*	*Dása.*	*Guha.*

MAULIKA 72.

Guhan.	*Gaṇa.*	*Hada.*	*Huhin.*	*Nága.*	*Bhadra.*
Soma.	*Pui.*	*Rudra.*	*Pála.*	*Áditya.*	*Chandra.*
Sánya, or *Sain.*			*Suin, etc.*		
S'yáma, etc.					
Teja, etc.					
Cháki, etc.					

The others are omitted for the sake of brevity; their names seldom occur in common intercourse.

[3] [In Bengal the next divisions below the Brahmans are the Baidyas or medical, and the Káyasthas or writer cast,—then come the nine divisions called the Naba S'ák, *i.e.* the Gopa or cowherd, the Málí or gardener, the Tailí or oilman, the Tantrí or weaver, the Modaka or confectioner, the Varají or betel-cultivator, the Kulála or potter, the Karmakára or smith, and the Nápita or barber. Below these are the low casts from whom a Brahman cannot accept water, such as the Gándhika or spice-seller, S'ankhakára or worker in shells, Kaivartaka or fisherman, Sauvarṇabaṇij or goldsmith, etc.; some of the richest families in Calcutta, who have been bankers for more than a century, belong to the Sauvarṇabaṇij cast. Lower than all are the Bediyás, Ḍoms, Háḍis, etc.]

The distinctions of families are important in regulating intermarriages. Genealogy is made a particular study; and the greatest attention is given to regulate the alliance according to established rules, particularly in the first marriage of the eldest son. The principal points to be observed are, not to marry within the prohibited degrees; nor in a family known by its name to be of the same primitive stock; nor in one of inferior rank; nor even in an inferior branch of an equal one; for within some families gradations are established. Thus, among the Kulína of the Káyasthas, the rank has been counted from thirteen degrees; and in every generation, so long as the marriage has been properly assorted, one degree has been added to the rank. But, should a marriage be contracted in a family of a lower degree, an entire forfeiture of such rank would be incurred.

VII.

OBSERVATIONS ON THE SECT OF JAINS.[1]

[From the *Asiatic Researches*, vol. ix. pp. 287–322. *Calcutta*, 1807. 4to.]

[191] The information collected by Major Mackenzie, concerning a religious sect hitherto so imperfectly known as that of the Jainas, and which has been even confounded with one more numerous and more widely spread (the sect of Buddha), may furnish the ground of further researches, from which an exact knowledge of the tenets and practice of a very remarkable order of people may be ultimately expected. What Major Mackenzie has communicated to the Society, comes from a most authentic source; the declarations of two principal priests of the Jainas themselves. It is supported by similar information, procured from a like source, by Dr. F. Buchanan, during his journey in Mysore, in the year following the reduction of Seringapatam. Having the permission of Dr. Buchanan to use the extracts, which I had his leave to make from the journal kept by him during that journey, I have inserted, in the preceding article, the information received by him from priests of the Jaina sect.[2]

I am enabled to corroborate both statements, from conversation with Jaina priests, and from books in my possession, written by authors of the Jaina persuasion. Some of those volumes were procured for me at Benares; others were ob-

[1] [Cf. the Essay on the Jainas in vol. i.]

[2] [Major Mackenzie's paper is found in *As. Researches*, vol. ix. pp. 244-278, and the extract from Dr. Buchanan's Journal, pp. 279–286.

tained from the present Jagat Set, at Murshidábád, who, having changed his religion, to adopt the wor[192]ship of Vishṇu, forwarded to me, at my request, such books of his former faith as were yet within his reach.

It appears, from the concurrent result of all the inquiries which have been made, that the Jainas constitute a sect of Hindus, differing, indeed, from the rest in some very important tenets; but following, in other respects, a similar practice, and maintaining like opinions and observances.

The essential character of the Hindu institutions is the distribution of the people into four great tribes. This is considered by themselves to be the marked point which separates them from Mlechhas or Barbarians. The Jainas, it is found, admit the same division into four tribes, and perform like religious ceremonies, termed *sanskáras*, from the birth of a male to his marriage. They observe similar fasts, and practise, still more strictly, the received maxims for refraining from injury to any sentient being. They appear to recognize as subordinate deities, some, if not all, of the gods of the prevailing sects; but do not worship, in particular, the five principal gods of those sects; or any one of them by preference; nor address prayers, or perform sacrifice, to the sun, or to fire: and they differ from the rest of the Hindus, in assigning the highest place to certain deified saints, who, according to their creed, have successively become superior gods. Another point in which they materially disagree is the rejection of the Vedas, the divine authority of which they deny; condemning, at the same time, the practice of sacrifices, and the other ceremonies which the followers of the Vedas perform, to obtain specific promised consequences in this world or in the next.

In this respect the Jainas resemble the Bauddhas or Saugatas, who equally deny the divine authority of the Vedas; and who similarly worship certain pre-eminent saints, admitting likewise, as subordinate deities, nearly [193] the whole

pantheon of the orthodox Hindus. They differ, indeed, in regard to the history of the personages whom they have deified; and it may be hence concluded, that they have had distinct founders; but the original notion seems to have been the same. In fact, this remarkable tenet, from which the Jainas and Bauddhas derive their most conspicuous peculiarities, is not entirely unknown to the orthodox Hindus. The followers of the Vedas, according to the theology which is explained in the Vedánta, considering the human soul as a portion of the divine and universal mind, believe that it is capable of perfect union with the divine essence: and the writers on the Vedánta not only affirm, that this union and identity are attained through a knowledge of God, as by them taught; but have hinted, that by such means the particular soul becomes God, even to the actual attainment of supremacy.[1]

So far the followers of the Vedas do not virtually disagree with the Jainas and Bauddhas. But they have not, like those sects, framed a mythology upon the supposed history of the persons who have successively attained divinity; nor have they taken these for the objects of national worship. All three sects agree in their belief of transmigration. But the Jainas are distinguished from the rest by their admission of no opinions, as they themselves affirm, which are not founded on perception, or on proof drawn from that, or from testimony.[2]

It does not, however, appear, that they really withhold belief from pretended revelations: and the doctrines which characterize the sect are not confined to a single tenet; but form an assemblage of mythological and metaphysical ideas found among other sects, joined to many visionary and fantastic notions of their own.

[194] Their belief in the eternity of matter, and perpetuity of the world, is common to the Sánkhya philosophy, from

[1] Vṛihad áraṇyaka upanishad.

[2] [Mádhava makes them hold (like the Buddhists) only two pramáṇas, perception and inference.]

which it was, perhaps, immediately taken. Their description of the world has much analogy to that which is given in the Purāṇas, or Indian theogonies: but the scheme has been rendered still more extravagant. Their precaution to avoid injuring any being is a practice inculcated in the orthodox religion, but which has been carried by them to a ludicrous extreme.[1]

In their notions of the soul, and of its union with the body, and of retribution for good and evil, some analogy is likewise observable. The Jainas conceive the soul *(jiva)* to have been eternally united to a very subtil material body, or rather to two such bodies, one of which is invariable, and consists (if I rightly apprehend their metaphysical notions) of the powers of the mind; the other is variable, and is composed of its passions and affections (this, at least, is what I understand them to mean by the *taijasa* and *kármaṇa śariras*). The soul, so embodied, becomes, in its successive transmigrations, united with a grosser body denominated *audárika*,[2] which retains a definite form, as man and other mundane beings; or it is joined with a purer essence, varying in its appearance at pleasure, as the gods and genii. This last is termed *vaikárika.* They distinguish a fifth sort of body, under the name of *áhárika*, which they explain as a minute form, issuing from the head of a meditative sage, to consult an omniscient saint; and returning with the desired information to the person whence that form issued, or rather from which it was elongated; for they suppose the communication not to have been interrupted.

[195] The soul is never completely separated from matter, until it obtain a final release from corporeal sufferance, by deification, through a perfect disengagement from good and evil, in the person of a beatified saint. Intermediately it

[1] Jaina priests usually bear a broom adapted to sweep insects out of their way; lest they should tread on the minutest being.

[2] [*Audarika ?*]

receives retribution for the benefits or injuries ascribable to it in its actual or precedent state, according to a strict principle of retaliation, receiving pleasure or pain from the same individual, who, in a present or former state, was either benefited or aggrieved.

Major Mackenzie's information confirms that which I had also received, concerning the distribution of these sectaries into clergy and laity. In Hindustán the Jainas are usually called Syauras[1]; but distinguish themselves into Śrávakas and Yatis. The laity (termed S'rávaka) includes persons of various tribes, as, indeed, is the case with Hindus of other sects: but, on this side of India, the Jainas are mostly of the Vaiśya class.[2] The orthodox Hindus have a secular, as well as a regular, clergy: a Bráhmaṇa, following the practice of officiating at the ceremonies of his religion, without quitting the order of a householder, may be considered as belonging to the secular clergy; one who follows a worldly profession (that of husbandry, for example) appertains to the laity; and so do people of other tribes: but persons, who have passed into the several orders of devotion, may be reckoned to constitute the regular clergy. The Jainas have, in like manner, priests who have entered into an order of devotion; and also employ Bráhmaṇas at their ceremonies; and, for want of Brahmaṇas of their own faith, they even have recourse to the secular clergy of the orthodox sect. This subject is sufficiently explained by Major Mackenzie [196] and Dr. Buchanan; I shall, however, add, for the sake of a subsequent remark, that the Jainas apply the terms Yati and S'ramaṇa (in Prákrit and Hindí written Samaṇa) to a person who has devoted himself to religious contemplation and austerity; and the sect of Buddha uses the word S'ramaṇa for the same meaning. It cannot be doubted, that the Sommonacodom of Siam is merely

[1] [According to Shakespear *sevṛā*.]

[2] I understand that their Vaiśya class includes eighty-four tribes: of whom the most common are those denominated Oswál, Agarwál, Pariwár, and Khandewál.

a corruption of the words S'ramaṇa Gautama, the holy Gautama or Buddha.[1]

Having been here led to a comparison of the Indian sects which follow the precepts of the Vedas with those which reject their authority, I judge it necessary to notice an opinion, which has been advanced, on the relative antiquity of those religions; and especially the asserted priority of the Bauddhas before the Bráhmaṇas.

In the first place, it may be proper to remark, that the earliest accounts of India, by the Greeks who visited the country, describe its inhabitants as distributed into separate tribes.[2] Consequently a sect, which, like the modern Bauddhas, has no distinction of cast, could not have been then the most prevalent in India.

If is indeed possible that the followers of Buddha may, like the Jainas, have retained the distribution into four tribes, so long as they continued in Hindustán. But in that case, they must have been a sect of Hindus; and the question, which is most ancient, the Bráhmaṇa or the Bauddha, becomes a solecism.

If it be admitted that the Bauddhas are originally a sect of Hindus, it may be next questioned whether that, or any of the religious systems now established, be the most [197] ancient. I have, on a former occasion,[3] indicated the notions which I entertain on this point. According to the hypothesis which I then hinted, the earliest Indian sect of which we have any present distinct knowledge, is that of the followers of the practical Vedas, who worshipped the sun, fire, and the elements; and who believed the efficacy of sacrifices, for the accomplishment of present and of future purposes. It may be supposed that the refined doctrine of the Vedántís, or followers

[1] See As. Res. vol. vii. p. 415.

[2] Seven tribes are enumerated: but it is not difficult to reconcile the distributions which are stated by Arrian and Strabo, with the present distribution into four classes.

[3] As. Res. vol. viii. p. 474. (vol. i. p. 110, 111 [old. ed.], of the present work.)

of the theological and argumentative part of the Vedas, is of later date: and it does not seem improbable that the sects of Jina and of Buddha are still more modern. But I apprehend that the Vaishṇavas, meaning particularly the worshippers of Ráma and of Kṛishṇa,[1] may be subsequent to those sects, and that the S'aivas also are of more recent date.

I state it as an hypothesis, because I am not at present able to support the whole of this position on grounds which may appear quite satisfactory to others; nor by evidence which may entirely convince them. Some arguments will, [198] however, be advanced, to show that the supposition is not gratuitous.

The long sought history of Káshmír,[2] which in the original Sanskrit was present to the Emperor Akbar, as related by Abú'l-Fazl in the Áyíni Akbarí,[3] and of which a Persian translation exists, more ample than Abú'l-Fazl's brief abstract, has been at length recovered in the original language.[4] A fuller account of this book will be hereafter submitted to the

[1] In explanation of a remark contained in a former essay (vol. i. p. [110, etc.] of the present work), I take this occasion of adding, that the mere mention of Ráma or of Kṛishṇa, in a passage of the Vedas, without any indication of peculiar reverence, would not authorize a presumption against the genuineness of that passage, on my hypothesis; nor, admitting its authenticity, furnish an argument against that system. I suppose both heroes to have been known characters in ancient fabulous history; but conjecture that, on the same basis, new fables have been constructed, elevating those personages to the rank of gods. On this supposition, the simple mention of them in genuine portions of the Vedas, particularly in that part of it which is entitled Bráhmaṇa, would not appear surprising. Accordingly, Kṛishṇa, son of Devakí, is actually named in the Chhándogya upanishad (towards the close of the 3rd chapter, [iii. 17. 6.]) as having received theological information from Ghora, a descendant of Angiras. This passage, which had escaped my notice, was indicated to me by Mr. Speke from the Persian translation of the Upanishad. [Cf. Burnouf, *Introd.* p. 136, where he thinks that the earlier Buddhist Sútras never allude to Kṛishṇa. The name occurs, however, in the 'developed Sútras' of Nepál, as *e.g.* Lalita-vistara, p. 148. 17.]

[2] [The Rájataranginí was analyzed by Wilson in *Asiatic Researches*, vol. xv., and translated by Troyer for the Oriental Translation Society. The Sanskrit text was printed at Calcutta in 1835.]

[3] Vol. ii. p. 178.

[4] The copy which I possess belonged to a Bráhmaṇa, who died some months ago (1805) in Calcutta. I obtained it from his heirs.

Society: the present occasion for the mention of it, is a passage which was cited by Dr. Buchanan,[1] from the English translation of the Áyíni Akbarí, for an import which is not supported by the Persian or Sanskrit text.

The author, after briefly noticing the colony established in Káshmír by Kaśyapa, and hinting a succession of kings to the time of the Kurus and Páṇḍavas, opens his detailed history, and list of princes, with Gonarda, a contemporary of Yudhishṭhira. He describes Aśoka (who was twelfth in succession from Gonarda), and his son Jaloka, and grandson Dámodara, as devout worshippers of S'iva; and Jaloka, in particular, as a conqueror of the Mlechhas, or barbarians. Dámodara, according to this history, was succeeded by three kings of the race of Turushka; and they were followed by a Bodhisattwa, who wrested the empire from them by the aid of S'ákyasinha, and introduced the religion of Buddha into Káshmír. He reigned a hundred years; and the next sovereign was Abhimanyu, who destroyed the Bauddhas, and re-established the doctrines of theNíla-puráṇa. This account is so far [199] from proving the priority of the Bauddhas, that it directly avers the contrary.

From the legendary tales concerning the last Buddha, current in all the countries, in which his sect now flourishes;[2] and upon the authority of a life of Buddha in the Sanskrit language, under the title of Lalita-puráṇa, which was procured by Major Knox, during his public mission in Nepál, it can be affirmed, that the story of Gautama Buddha has been engrafted on the heroic history of the lunar and solar races, received by the orthodox Hindus; an evident sign that his sect is subsequent to that in which this fabulous history is original.[3]

[1] As Res. vol. vi. p. 165.

[2] Tachard, *Voyage de Siam*. Laloubère, *Royaume de Siam*.

[3] [This probably alludes to the legend given from Páli sources by Fausböll in *Ind. Stud.* v. 412-428, and from Tibetan sources by Csoma de Körösi, J.A.S.B., ii. 389. The S'ákya royal family of Kapilavastu is there traced up to Ikshwáku

The same remark is applicable to the Jainas, with whom the legendary story of their saints also seems to be engrafted on the *pauráṇic* tales of the orthodox sect. Sufficient indication of this will appear, in the passages which will be subsequently cited from the writings of the Jainas.

Considerable weight might be allowed to an argument deduced from the aggravated extravagance of the fictions admitted by the sects of Jina and Buddha. The mythology of the orthodox Hindus, their present chronology adapted to astronomical periods, their legendary tales, their mystical allegories, are abundantly extravagant. But the Jainas and Bauddhas surpass them in monstrous exaggerations of the same kind. In this rivalship of absurd fiction it would not be unreasonable to pronounce that to be most modern which has outgone the rest.

The greater antiquity of the religion of the Vedas is also rendered probable, from the prevalence of a similar worship of the sun and of fire in ancient Persia. Nothing forbids the supposition that a religious worship, which was there established in times of antiquity, may have also existed [200] from a remote period in the country between the Ganges and the Indus.

The testimony of the Greeks preponderates greatly for the early prevalence of the sect, from which the present orthodox Hindus are derived. Arrian, having said that the Brachmanes were the sages or learned among the Indians,[1] mentions them under the latter designation (σοφισταὶ) as a distinct tribe, 'which, though inferior to the others in number, is superior in rank and estimation: bound to no bodily work, nor con-

of the solar race. The Lalita-vistara has a curious passage, where the Bodhisattwas consult as to which family S'ákya-muni is to be born in. They successively reject as unworthy the royal families of the Magadhas, the Kośalas, the Vatsas (of Kauśámbí), the republic of Vais'álí, the Pradyotanas (of Ujjayiní), and the royal families of Mathurá, Hastinápura and Mithilá; and they eventually select the S'ákyas of Kapilavastu.]

[1] Καὶ τῶν Βραχμάνων οἳ δὴ σοφισταὶ τοῖς Ἰνδοῖς εἰσιν, κ. τ. λ. Exp. Al. vi. 16.

tributing anything from labour to the public use; in short, no duty is imposed on that tribe, but that of sacrificing to the gods, for the common benefit of the Indians; and, when any one celebrates a private sacrifice, a person of that class becomes his guide; as if the sacrifices would not else be acceptable to the gods.'[1]

Here, as well as in the sequel of the passage, the priests of a religion consonant to the Vedas, are well described: and what is said, is suitable to them; but to no other sect, which is known to have at any time prevailed in India.

A similar description is more succinctly given by Strabo, 'It is said, that the Indian multitude is divided into seven classes; and that the philosophers are first in rank, but fewest in number. They are employed, respectively, for private benefit, by those who are sacrificing or worshipping, etc.'[2]

In another place he states, on the authority of Megasthenes, 'Two classes of philosophers or priests; the Brachmanes and Germanes:[3] but the Brachmanes are best [201] esteemed, because they are most consistent in their doctrine.'[4] The author then proceeds to describe their manners and opinions: the whole passage is highly deserving of attention, and will be found, on consideration, to be more suitable to the orthodox Hindus, than to the Bauddhas or Jainas: particularly towards the close of his account of the Brachmanes, where he says, 'In many things they agree with the Greeks; for they affirm, that the world was produced and is perishable; and that it is spherical: that God, governing it as well as framing it, pervades the whole: that the principles of all things are various; but water is the principle of the construction of the world:

[1] Νενέμηνται οἱ πάντες Ἰνδοὶ ἐς ἑπτὰ μάλιστα γενεάς· ἐν μὲν αὐτοῖσιν οἱ Σοφισταί εἰσι, κ. τ. λ. Arrian, Indic. c. 11.

[2] Φησὶ δὴ τὸ τῶν Ἰνδῶν πλῆθος εἰς ἑπτὰ μέρη διῃρῆσθαι, καὶ πρώτους μὲν τοὺς φιλοσόφους εἶναι, κ. τ. λ. Strab. xv. c. 1. (p. 703, ed. Casaub.)

[3] [These are probably the S'ramaṇas, or Brahmanical ascetics.]

[4] Ἄλλην δὲ διαίρεσιν ποιεῖται περὶ τῶν φιλοσόφων, δύο γένη φάσκων, ὧν τοὺς μὲν Βραχμᾶνας καλεῖ, τοὺς δὲ Γερμᾶνας. κ. τ. λ. Strab. xv. c. 1. p. 712.

that, besides the four elements, there is a fifth nature, whence heaven and the stars: that the earth is placed in the centre of all. Such and many other things are affirmed of reproduction, and of the soul. Like Plato, they devise fables concerning the immortality of the soul, and the judgment in the infernal regions; and other similar notions. These things are said of the Brachmanes.'

Strabo notices likewise another order of people opposed to the Brachmanes, and called Pramnæ:[1] he characterizes them as 'contentious cavillers, who ridiculed the Brachmanes, for their study of physiology and astronomy.'[2]

Philostratus, in the life of Apollonius, speaks of the Brachmanes as worshipping the sun. 'By day they pray to the sun respecting the seasons, which he governs, that he would send them in due time; and that India might thrive: and, in the evening, they intreat the solar [202] ray not to be impatient of night, and to remain as conducted from them.'[3]

Pliny and Solinus[4] also describe the Gymnosophists contemplating the sun: and Hierocles, as cited by Stephanus of Byzantium,[5] expressly declares the Brachmanes to be particularly devoted to the sun.

This worship, which distinguishes the orthodox Hindus, does not seem to have been at any time practised by the rival sects of Jina and Buddha.

Porphyrius, treating of a class of religious men, among the Indians, whom the Greeks were accustomed to call Gymnosophists, mentions two orders of them; one, the Brachmanes; the other, the Samanæans: 'the Brachmanes receive religious knowledge, like the priesthood, in right of birth; but the

[1] [Wilson (*As. Researches*, vol. xvii., p. 279) derives this name from Prámáṇika, a follower of the Nyáya school, but this is very doubtful.]

[2] *Φιλοσόφους τε τοῖς Βραχμᾶσιν ἀντιδιαιροῦνται Πράμνας ἐριστικούς τινας καὶ ἐλεγκτικούς. κ. τ. λ.* Strab. l. c. p. 718, 719.

[3] *Μεθ' ἡμέραν μὲν οὖν ἥλιον ὑπὲρ τῶν ὡρῶν, κ. τ. λ.* lib. iii. cap. 4.

[4] Plin., lib. vii. c. 2. Solin. i. 52.

[5] *Τὸ Βραχμάνων φῦλον ἀνδρῶν φιλοσόφων, καὶ θεοῖς φίλων, ἡλίῳ δὲ μάλιστα καθωσιωμένων.* Stephan. *de Urbibus, ad vocem* Brachmanes.

Samanæans are select, and consist of persons choosing to prosecute divine studies.' He adds, on the authority of Bardesanes, that 'all the Brachmanes are of one race; for they are all descended from one father and one mother. But the Samanæans are not of their race; being selected from the whole nation of Indians, as before mentioned. The Brachman is subject to no domination, and contributes nothing to others.'[1]

In this passage, the Brachman, as an hereditary order of priesthood, is contrasted with another religious order; to which persons of various tribes were admissible: and the Samanæans, who are obviously the same with the Germanes of Strabo, were doubtless Sannyásis; but may have be[203]longed to any of the sects of Hindus. The name seems to bear some affinity to the Śramaṇas, or ascetics of the Jainas and Bauddhas.

Clemens Alexandrinus does indeed hint, that all the Brachmanes revered their wise men as deities;[2] and in another place, he describes them as worshipping Hercules and Pan.[3] But the following passage from Clemens is most in point. Having said, that philosophy flourished anciently among the barbarians, and afterwards was introduced among the Greeks, he instances the prophets of the Egyptians, the Chaldees of the Assyrians; the Druids of the Gauls (Galatæ); the Samanæans of the Bactrians; the philosophers of the Celts; the Magi of the Persians; the Gymnosophists of the Indians: and proceeds thus:—'They are of two kinds, some called Sar-

[1] Porph. *de Abstinentia*, lib. iv. [This quotation, from Bardesanes' *Indica*, is the fullest classical account of the Buddhists. He divides the Indian Theologi into Brahmans and Samanæans, and then describes the latter at some length. Amongst other things he says that the novice must shave his body, adopt a peculiar dress, and give up his property, as well as abandon his family. They lived outside the city in houses of royal foundation; they prayed and took their meals at the sound of a bell, and were not allowed to marry or hold property. Each of these particulars may be illustrated from Mr. Hardy's *Eastern Monachism*, and there cannot be a doubt that the Samanæi are Buddhist ascetics, see Lassen, *Ind. Alt.*, vol. ii., p. 700; Müller's Introd. to *Buddhaghosha's Parables*, pp. lii., cxxxiii. *Samana* is the Páli form of the older *S'ramana*.]

[2] Καί μοι δοκοῦσιν, etc. Strom. lib. i. c. 15. p. 130, ed. Sylb.

[3] Strom. lib. iii. c. 7. p. 194, ed. Sylb.

manes, others Brachmanes. Among the Sarmanes, those called Allobii[1] neither inhabit towns, nor have houses; they are clad with the bark of trees,[2] and eat acorns, and drink water with their hands. They know not marriage, nor procreation of children; like those now called Encratetai (chaste) There are likewise, among the Indians, persons obeying the precepts of Butta, whom they worship as a god, on account of his extreme venerableness.'[3]

Here, to my apprehension, the followers of Buddha are [204] clearly distinguished from the Brachmanes and Sarmanes.[4] The latter, called Germanes by Strabo, and Samanæans by Porphyrius, are the ascetics of a different religion; and may have belonged to the sect of Jina, or to another. The Brachmanes are apparently those who are described by Philostratus and Hierocles, as worshipping the sun; and, by Strabo and by Arrian, as performing sacrifices for the common benefit of the nation, as well as for individuals. The religion which they practised was so far conformable with the precepts of the Vedas: and their doctrine and observances, their manners and opinions, as noticed by the authors above cited, agree with no other religious institutions known in India, but the orthodox sect. In short, the Bráhmaṇas are distinctly mentioned by Greek authors as the first of the tribes or castes, into which the Indian nation was then, as now, divided. They are expressly discriminated from the sect of Buddha by one ancient author, and from the Sarmanes, or Samanæans, (ascetics of various tribes) by others. They are described by

[1] Same with the Hylobii of Strabo.

[2] The bark dress indicates Brahmanical ascetics, cf. Müller, *ib.* p. lii.

[3] *Διττὸν δὲ τούτων τὸ γένος οἱ μὲν Σαρμάναι αὐτῶν, οἱ δὲ Βραχμάναι καλούμενοι. καὶ τῶν Σαρμανῶν οἱ Αλλόβιοι προσαγορευόμενοι, οὔτε πόλεις οἰκοῦσιν, οὔτε στέγας ἔχουσιν, δένδρων δὲ ἀμφιέννυνται φλοιοῖς, καὶ ἀκρόδρυα σιτοῦνται, καὶ ὕδωρ ταῖς χερσὶ πίνουσιν· οὐ γάμον, οὐ παιδοποιΐαν ἴσασιν, ὥσπερ οἱ νῦν Ἐγκρατηταὶ καλούμενοι. εἰσὶ δὲ τῶν Ινδῶν οἱ τοῖς Βούττα πειθόμενοι παραγγέλμασιν· ὃν δι' ὑπερβολὴν σεμνότητος εἰς Θεὸν τετιμήκασι.* Strom. lib. i. c. 15. p. 113, ed. Sylb.

[4] The passage has been interpreted differently; as if Clemens said, that the *Allobii* were those who worshipped Butta. (See Moreri, Art. *Samanéens.*) The text is ambiguous.

more than one authority, as worshipping the sun, as performing sacrifices, and as denying the eternity of the world, and maintaining other tenets incompatible with the supposition that the sects of Buddha or Jina could be meant. Their manners and doctrine, as described by these authors, are quite conformable with the notions and practice of the orthodox Hindus. It may therefore be confidently inferred, that the followers of the Vedas flourished in India when it was visited by the Greeks under Alexander: and continued to flourish from the time of Megasthenes, who described them in the fourth century before Christ, to that of Porphyrius, who speaks of [205] them, on later authority, in the third century after Christ.

I have thus stated, as briefly as the nature of the subject permitted, a few of the facts and reasons by which the opinion, that the religion and institutions of the orthodox Hindus are more modern than the doctrines of Jina and of Buddha, may, as I think, be successfully resisted. I have not undertaken a formal refutation of it, and have, therefore, passed unnoticed, objections which are founded on misapprehension.

It is only necessary to remark, that the past prevalence of either of those sects in particular places, with its subsequent persecution there by the worshippers of S'iva, or of Vishṇu, is no proof of its general priority. Hindustán proper was the early seat of the Hindu religion, and the acknowledged cradle of both the sects in question. They were foreigners in the Peninsula of India; and admitting, as a fact (what need not, however, be conceded), that the orthodox Hindus had not been previously settled in the Karṇáṭaka and other districts in which the Jainas or the Bauddhas have flourished, it cannot be thence concluded that the followers of the Vedas did not precede them in other provinces.

It may be proper to add, that the establishment of particular sects among the Hindus who acknowledge the Vedas, does not affect the general question of relative antiquity. The

special doctrines introduced by Sankará-chárya, by Rámánuja, and by Mádhwáchárya:[1] and of course the origin of the sects which receive these doctrines may be referred, with precision, to the periods when their authors lived: but the religion in which they are sectaries, has undoubtedly a much earlier origin.

To revert to the immediate object of these observations, which is that of explaining and supporting the information [206] communicated by Major Mackenzie: I shall, for that purpose, state the substance of a few passages from a work of great authority among the Jainas, entitled Kalpa-sútra, and from a vocabulary of the Sanskrit language by an author of the Jaina sect.

The Abhidhána-chintámani, a vocabulary of synonymous terms, by Hemachandrá-chárya, is divided into six chapters (*kándas*), the contents of which are thus stated in the author's preface. 'The superior deities (Devádhidevas) are noticed in the first chapter; the gods (Devas) in the second; men in the third; beings furnished with one or more senses in the fourth; the infernal regions in the fifth; and terms of general use in the sixth.' 'The earth,' observes this author, 'water, fire, air, and trees, have a single organ or sense (*indriya*); worms, ants, spiders, and the like, have two, three, or four senses; elephants, peacocks, fish, and other beings moving on the earth, in the sky or in water, are furnished with five senses: and so are gods and men, and the inhabitants of hell.'

The first chapter begins with the synonyma of a Jina or deified saint: among which the most common are Arhat, Jineśwara, Tírthankara or Tírthakara: others, *viz.* Jina, Sarvajna, and Bhagavat, occur also in the dictionary of Amara as terms for a Jina or Buddha; but it is deserving of remark, that neither Buddha, nor Sugata is stated by Hemachandra among these synonyma. In the subsequent chapter, however, on the subject of inferior gods, after noticing the gods of

[1] [Rather Madhwácharya, who founded the sect of the Mádhwácháris, see Wilson's *Essays*, vol. i., pp. 139-150, and *Sarvadarśana-sangraha*, pp. 61-73.]

Hindu mythology (Indra and the rest, including Brahmá, etc.), he states the synonyma of a Buddha, Sugata, or Bodhisattwa; and afterwards specifies seven such, *viz.* Vipaśyí, Śikhí, Víśwanna, Kukuchhanda, Kánchana, and Kásyapa,[1] expressly [207] mentioning as the seventh Buddha, S'ákyasinha, also named Sarvárthasiddha, son of S'uddhodana and Máyá, a kinsman of the sun, from the race of Gautama.

In the first chapter, after stating the general terms for a Jina or Arhat, the author proceeds to enumerate twenty-four Arhats, who have appeared in the present Avasarpiṇí age: and afterwards observes, that excepting Munisuvrata and Nemi, who sprung from the race of Hari, the remaining twenty-two Jinas were born in the line of Ikshwáku.[2] The fathers and mothers of the several Jinas are then mentioned; their attendants; their standards or characteristics; and the complexions with which they are figured or described.

The author next enumerates twenty-four Jinas who have appeared in the past Utsarpiṇí period; and twenty-four others who will appear in the future age: and, through the remainder of the first book, explains terms relative to the Jaina religion.

The names of the Jinas are specified in Major Mackenzie's communication.[3] Wherever those names agree with Hemachandra's enumeration, I have added no remark; but where a difference occurs I have noticed it, adding in the margin the name exhibited in the Sanskrit text.

I shall here subjoin the information gathered from Hemachandra's vocabulary, and from the Kalpa-sútra and other authorities, relative to the Jinas belonging to the present period. They appear to be the deified saints, who are now

[1] Two of these names occur in Captain Mahony's and Mr. Joinville's lists of five Buddhas. As. Res. vol. vii. p. 32 and 414. [Böhtlingk and Rieu read Viśwabhú and Krakuchhanda.]

[2] I understand that the Jainas have a mythological poem entitled Harivanśa-puráṇa, different from the Harivanśa of the orthodox. Their Ikshwáku, likewise, is a different person; and the name is said to be a title of their first Jina, Ṛishabha-deva. [Cf. Wilson's *Mackenzie Catal.* i. p. 153.]

[3] [In the Asiatic Researches, vol. ix. p. 244, etc.]

worshipped by the Jaina sect. They are all figured in the same contemplative posture, with little varia[208]tion in their appearance, besides a difference of complexion: but the several Jinas have distinguishing marks or characteristic signs, which are usually engraved on the pedestals of their images, to discriminate them.

1. Ṛishabha, or Vṛishabha, of the race of Ikshwáku, was son of Nábhi by Marudevá: he is figured of a yellow or golden complexion; and has a bull for his characteristic. His stature, as is pretended, was 500 poles *(dhanus)*; and the duration of his life, 8,400,000 great years *(púrva varsha)*. According to the Kalpa-sútra, as interpreted by the commentator, he was born at Kośalá or Ayodhyá (whence he is named Kauśalika), towards the latter part of the third age. He was the first king, first anchoret, and first saint; and is therefore entitled Prathama Rájá, Prathama Bhikshákara, Prathama Jina, and Prathama Tírthankara. At the time of his inauguration as king, his age was 2,000,000 years. He reigned 6,300,000 years; and then resigned his empire to his sons: and having employed 100,000 years in passing through the several stages of austerity and sanctity, departed from this world on the summit of a mountain, named Ashṭápada. The date of his apotheosis was 3 years and 8½ months before the end of the third age, at the precise interval of one whole age before the deification of the last Jina.

2. Ajita was son of Jitaśatru by Vijayá: of the same race with the first Jina, and represented as of the like complexion; with an elephant for his distinguishing mark. His stature was 450 poles; and his life extended to 7,200,000 great years. His deification took place in the fourth age, when fifty *lakshas* of *krors* of oceans of years had elapsed out of the tenth *kror* of *krors.*[1]

[1] The divisions of time have been noticed by Major Mackenzie, As. Res. vol. ix. p. 267, and will be further explained.

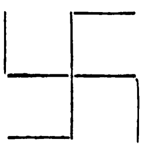
[209] 3. Sambhava was son of Jitári by Sená: of the same race and complexion with the preceding; distinguished by a horse; his stature was 400 poles; he lived 6,000,000 years; and he was deified 30 *lakshas* of *krors* of *ságaras* after the second Jina.

4. Abhinandana was son of Sambara by Siddhárthá: he has an ape for his peculiar sign. His stature was 300 poles; and his life reached to 5,000,000 years. His apotheosis was later by 10 *lakshas* of *krors* of *ságaras* than the foregoing.

5. Sumati was son of Megha by Mangalá: he has a curlew for his characteristic. His life endured 4,000,000 years, and his deification was nine *lakshas* of *krors* of *ságaras* after the fourth Jina.

6. Padmaprabha was son of S'rídhara by Susímá; of the same race with the preceding, but described of a red complexion. He has a lotus for his mark: and lived 3,000,000 years, being 200 poles in stature. He was deified 90,000 *krors* of *ságaras* after the fifth Jina.

7. Supárśwa was son of Pratishṭha by Pṛithwí; of the

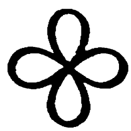


same line with the foregoing, but represented with a golden complexion; his sign is the figure called Swastika. He lived 2,000,000 years; and was deified 9,000 *krors* of *ságaras* subsequent to the sixth Jina.

8. Chandraprabha was son of Mahásena by Lakshmaṇá; of the same race with the last, but figured with a fair complexion: his sign is the moon: his stature was 150 poles, and he lived 1,000,000 years; and his apotheosis took place 900 *krors* of *ságaras* later than the seventh Jina.

9. Pushpadanta, also named Suvidhi, was son of Supriya by Rámá: of the same line with the preceding, [210] and described of a similar complexion: his mark is a marine monster (*makara*): his stature was 100 poles, and the duration of his life 200,000 years. He was deified 90 *krors* of *ságaras* after the eighth Jina.

10. Sítala was son of Dṛidharatha by Nandá: of the same race, and represented with a golden complexion: his characteristic is the mark called Srivatsa. His stature was 90 poles; and his life 100,000 great years; his deification dates 9 krors of ságaras later than the preceding.



11. Sreyán, Sreyas, or Sreyánsa, was son of Vishṇu by Vishṇá: of the same race, and with a similar complexion; having a rhinoceros for his sign. He was 80 poles in stature, and lived 8,400,000 common years. His apotheosis took place more than 100 ságaras of years before the close of the fourth age.

12. Vásupújya was son of Vasupújya by Jayá: of the same race, and represented with a red complexion, having a buffalo for his mark; and he was 70 poles high, lived 7,200,000 years, and was deified later by 54 ságaras than the eleventh Jina.

13. Vimala was son of Kritavarman by Syámá; of the same race: described of a golden complexion, having a boar for his characteristic; he was 60 poles high, lived 6,000,000 years, and was deified 30 *ságaras* later than the twelfth Jina.

14. Ananta, also named Anantajit, was son of Sinhasena by Suyaśáh. He has a falcon for his sign; his stature was 50 poles, the duration of his life 3,000,000 years, and his apotheosis 9 *ságaras* after the preceding.

15. Dharma was son of Bhánu by Suvratá; characterized by the thunderbolt: he was 45 poles in stature, and lived 1,000,000 years: he was deified 4 *ságaras* later than the foregoing.

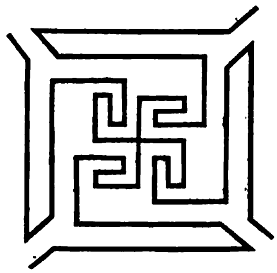
[211] 16. S'ánti was son of Viśwasena by Achirá, having an antelope for his sign; he was 40 poles high, lived 100,000 years, and was deified 2 *ságaras* subsequent to the last mentioned.[1]

17. Kunthu was son of Súra, by S'rí; he has a goat for his

[1] The life of this Jina is the subject of a separate work entitled S'ánti-puráṇa.

mark; his height was 35 poles, and his life 95,000 years. His apotheosis is dated in the last *palya* of the fourth age.

18. Ara was son of Sudarśana by Deví: characterized by the figure called Nandávarta:



his stature was 30 poles, his life 84,000 years, and his deification 1000 *krors* of years before the next Jina.

19. Malli was son of Kumbha by Prabhávatí; of the same race with the preceding; and represented of a blue complexion; having a jar for his characteristic; he was 25 poles high, and lived 55,000 years; and was deified 6,584,000 years before the close of the fourth age.

20. Munisuvrata, also named Suvrata, or Muni, was son of Sumitra by Padmá, sprung from the race called Harivanśa; represented with a black complexion, having a tortoise for his sign: his height was 20 poles, and his life extended to 30,000 years. His apotheosis is dated 1,184,000 years before the end of the fourth age.

[212] 21. Nimi was son of Vijaya by Viprá; of the race of Ikshwáku: figured with a golden complexion; having for his mark a blue water-lily (*nílotpala*); his stature was 15 poles; his life 10,000 years; and his deification took place 584,000 years before the expiration of the fourth age.

22. Nemi, also called Arishṭanemi, was son of the king Samudrajaya by S'ivá; of the line denominated Harivanśa; described as of a black complexion, having a conch for his sign. According to the Kalpa-sútra, he was born at Soriyapura; and, when 300 years of age, entered on the practice of

austerity. He employed 700 years in passing through the several stages of sanctity; and, having attained the age of 1000 years, departed from this world at Ujjinta, which is described as the peak of a mountain, the same, according to the commentator, with Giranára.[1] The date of this event is 84,000 years before the close of the fourth age.

23. Páráwa (or Páráwanátha) was son of the king Aśwasena by Vámá, or Bámádeví; of the race of Ikshwáku; figured with a blue complexion, having a serpent for his characteristic. The life of this celebrated Jina, who was perhaps the real founder of the sect, is the subject of a poem entitled Páráwanátha-charitra. According to the Kalpa-sútra, he was born at Báṇárasi,[2] and commenced his series of religious austerities at thirty years of age; and having completed them in 70 years, and having consequently attained the age of 100 years, he died on Mount Sammeya or Samet.[3] This happened precisely [213] 250 years before the apotheosis of the next Jina: being stated by the author of the Kalpa-sútra at 1230 years before the date of that book.

24. Vardhamána, also named Víra, Mahávíra, etc., and surnamed Charama-tírthakṛit, or last of the Jinas: emphatically called S'ramaṇa, or the saint. He is reckoned son of Siddhártha by Triśalá; and is described of a golden complexion, having a lion for his symbol.

The subject of the Kalpa-sútra, before cited, is the life and institutions of this Jina.[4] I shall here state an abstract of his history as there given, premising that the work, like other religious books of the Jainas, is composed in the Prákrit called Mágadhí; and that the Sanskrit language is used by the Jainas

[1] I understand this to be a mountain situated in the west of India; and much visited by pilgrims. [It is in the peninsula of Kattiwar.]

[2] Bhelúpurá, in the suburbs of Benares, is esteemed holy, as the place of his nativity.

[3] Samet-śikhara, called in Major Rennel's map Parsonaut, is situated among the hills between Bihár and Bengal. Its holiness is great in the estimation of the Jainas: and it is said to be visited by pilgrims from the remotest provinces of India.

[4] [Translated by Stevenson, 1848].

for translations, or for commentaries, on account of the great obscurity of the Prákrit tongue.[1]

According to this authority, the last Tírthankara, quitting the state of a deity, and relinquishing the longevity of a god, to obtain immortality as a saint, was incarnate towards the close of the fourth age (now past), when 75 years and 8½ months of it remained. He was at first conceived by Devánandá, wife of Ṛishabhadatta, a Bráhmaṇa inhabiting Bráhmaṇakunda-gráma, a city of Bhárata-varsha, in Jambu-dwípa. The conception was announced to her by [214] dreams. Indra,[2] or S'akra, who is the presiding deity on the south of Meru, and abides in the first range of celestial regions, called Saudharma, being apprised of Mahávíra's incarnation, prostrated himself, and worshipped the future saint; but reflecting that no great personage was ever born in an indigent and mendicant family, as that of a Bráhmaṇa, Indra commanded his chief attendant Hariṇaigumeshí, to remove the fetus from the womb of Devánandá to that of Triśalá, wife of Siddhártha, a prince of the race of Ikshwáku, and of the Káśyapa family. This was accordingly executed; and the new conception was announced to Triśalá by dreams; which were expounded by soothsayers, as foreboding the birth of a future Jina. In due time, he was born; and his birth celebrated with great rejoicings.

His father gave him the name of Vardhamána. But he is also known by two other names, S'ramaṇa and Mahávíra. His father has similarly three appellations, Siddhártha, S'reyánśa, and Yaśaswí; and his mother likewise has three

[1] This Prákrit, which does not differ much from the language introduced by dramatic poets into their writings, and assigned by them to the female persons in their dramas; is formed from Sanskrit. I once conjectured it to have been formerly the colloquial dialect of the Sáraswata Bráhmans [page [21] of the present volume]; but this conjecture has not been confirmed by further researches. I believe it to be the same language with the Páli of Ceylon. [Cf. Weber, *Fragment der Bhagavatí.*]

[2] The Jainas admit numerous Indras; but some of the attributes, stated in this place by the Kalpa-sútra, belong to the Indra of the Indian mythology.

titles, Triśalá, Videhadinná, and Prítikáriṇí. His paternal uncle was Supárświa, his elder brother, Nandivardhana, his sister (mother of Jamáli) Sudarśaná. His wife was Yaśodá, by whom he had a daughter (who became wife of Jamáli), named Anojjá and Priyadarśaná. His grand-daughter was called Śeshavatí and Yaśovatí.

His father and mother died when he was twenty-eight years of age; and he afterwards continued two years with his elder brother: after the second year he renounced worldly pursuits, and departed, amidst the applauses of gods and men, to practise austerities. The progress of his [215] devout exercises, and of his attainment of divine knowledge, is related at great length. Finally, he became an Arhat, or Jina, being worthy of universal adoration, and having subdued all passions;[1] being likewise omniscient and all-seeing: and thus, at the age of seventy-two years, he became exempt from all pain for ever. This event is stated to have happened at the court of king Hastipála, in the city of Páwápurí or Pápápurí;[2] and is dated three years and eight and a half months before the close of the fourth age, (called *Duḥkhamá-sukhamá*) in the great period named *avasarpiṇi*. The author of the Kalpa-sútra mentions, in several places, that when he wrote, 980 years had elapsed since this apotheosis.[3] According to tradition, the death of the last Jina happened more than two thousand four hundred years since; and the Kalpa-sútra appears, therefore, to have been composed about fifteen hundred years ago.[4]

[1] So the commentator expounds both terms.

[2] Near Rájagṛiha, in Bihár. It is accordingly a place of sanctity. Other holy places, which have been mentioned to me, are Champápurí, near Bhágalpúr, Chandrávatí distant ten miles from Benares, and the ancient city Hastinápura in Hindustán: also S'atrunjaya, said to be situated in the west of India. [Stevenson describes it as "84 miles from Bhownagur in Guzerat."]

[3] Samaṇassa bhagaväu Maháhbírassa jáva duḥkha hiṇassa nava bása sayáïn bikwantáïn dasamassaya bása sayassa ayam así ime sambachhare kále gachhaï. "Nine hundred years have passed since the adorable Mahábíra became exempt from pain; and of the tenth century of years, eighty are the time which is now elapsed."

[4] The most ancient copy in my possession, and the oldest one which I have seen, is dated in 1614 *Samvat*: it is nearly 250 years old.

The several Jinas are described as attended by numerous followers, distributed into classes, under a few chief disciples, entitled Gaṇadharas, or Gaṇádhipas. The last Jina had nine such classes of followers, under eleven disciples; Indrabhúti, Agnibhúti, Váyubhúti, Vyakta, Sudharmá, Maṇḍitaputra, Mauryaputra, Akampita, [216] Achalabhrátá, Mevárya,[1] Prabhása. Nine of these disciples died with Mahávíra; and two of them, Indrabhúti and Sudharmá, survived him, and subsequently attained beatitude. The Kalpa-sútra adds, that all ascetics, or candidates for holiness, were pupils in succession from Sudharmá, none of the others having left successors. The author then proceeds to trace the succession from Sudharmá to the different *śákhás*, or orders of priests, many of which appear still to exist. This enumeration disproves the list communicated to Major Mackenzie by the head priest of Belligola.

The ages and periods which have been more than once alluded to in the foregoing account of the Jainas, are briefly explained in Hemachandra's vocabulary. In the second chapter, which relates to the heavens and the gods, etc., the author, speaking of time, observes, that it is distinguished into *Avasarpiṇí* and *Utsarpiṇí*, adding that the whole period is completed by twenty *koṭis* of *koṭis* of *ságaras*; or 2,000,000,000,000,000 oceans of years. I do not find that he anywhere explains the space of time denominated *ságara*, or ocean. But I understand it to be an extravagant estimate of the time, which would elapse, before a vast cavity filled with chopped hairs could be emptied, at the rate of one piece of hair in a century: the time requisite to empty such a cavity, measured by a *yojana* every way, is a *palya*;[2] and that repeated ten *koṭis* of *koṭis* of times,[3] is a *ságara*.

Each of the periods above mentioned is stated by Hema-

[1] [Hemachandra and *As. Res.* vol. ix. read *Metárya*.]

[2] [Cf. Hemachandra's *Abhidhána* 132, and p. 304. Other authorities give a different statement, see Wilson, *Essays*, i. 309.]

[3] 1,000,000,000,000,000 *palyas* = one *ságara*, or *ságaropama*.

chandra as comprising six *aras;* the names and duration of which agree with the information communicated to Major Mackenzie. In the one, or the declining period, they pass from extreme felicity (*ekánta sukha*), through [217] intermediate gradations, to extreme misery (*ekánta duḥkha*). In the other, or rising period, they ascend, in the same order, from misery to felicity. During the three first ages of one period, mortals lived for one, two, or three *palyas;* their stature was one, two, or three leagues (*gavyútis*); and they subsisted on the fruit of miraculous trees; which yielded spontaneously food, apparel, ornaments, garlands, habitation, nurture, light, musical instruments, and household utensils. In the fourth age, men lived ten millions of years; and their stature was 500 poles (*dhanus*): in the fifth age, the life of man is a hundred years: and the limit of his stature, seven cubits: in the sixth, he is reduced to sixteen years, and the height of one cubit. In the next period, this succession of ages is reversed, and afterwards they recommence as before.

Here we cannot but observe, that the Jainas are still more extravagant in their inventions than the prevailing sects of Hindus, absurd as these are in their fables.

In his third chapter, Hemachandra, having stated the terms for paramount and tributary princes, mentions the twelve Chakravartís, and adds the patronymics and origin of them. Bharata is surnamed Árshabhi, or son of Ṛishabha; Maghavan is son of Vijaya; and Sanatkumára, of Aśwasena. Śánti, Kunthu, and Ara are the Jinas so named. Sagara is described as son of Sumitra; Subhúma is entitled Kártavírya; Padma is said to be son of Padmottara; Harisheṇa of Hari; Jaya of Vijaya; Brahmadatta of Brahma; and all are declared to have sprung from the race of Ikshwáku.

A lists follows, which, like the preceding, agrees nearly with the information communicated to Major Mackenzie. It consists of nine persons, entitled Vásudevas, and Kṛishṇas. Here Tripṛishṭha is mentioned with the patronymic Prájá-

patya; Dwipṛishṭha is said to have sprung from [218] Brahma; Swayambhú is expressly called a son of Rudra; and Purushottama, of Soma, or the moon. Purushasinha is surnamed Śaivi, or son of Śiva; Purushapuṇḍaríka is said to have sprung from Mahásiras. Datta is termed son of Agnisinha; Nárâyaṇa has the patronymic Dáśarathi (which belong to Rámachandra): and Kṛishṇa is described as sprung from Vasudeva.

Nine other persons are next mentioned, under the designation of Śukla-balas, *viz.* 1. Achala, 2, Vijaya, 3. Bhadra, 4. Suprabha, 5. Sudarśana, 6. Ánanda, 7. Nandana, 8. Padma, 9. Ráma.

They are followed by a list of nine foes of Vishṇu: it corresponds nearly with one of the lists noticed by Major Mackenzie, *viz.* 1. Aśwagríva, 2. Táraka, 3. Meraka, 4. Madhu, 5. Niśumbha, 6. Bali, 7. Prahláda. 8. The king of Lanká (Rávaṇa). 9. The king of Magadha (Jarásandha).

It is observed, that, with the Jinas, these complete the number of sixty-three eminent personages, *viz.* 24 Jinas, 12 Chakravartís, 9 Vásudevas, 9 Baladevas, and 9 Prativásudevas.

It appears from the information procured by Major Mackenzie, that all these appertain to the heroic history of the Jaina writers. Most of them are also well known to the orthodox Hindus, and are the principal personages in the Puráṇas.

Hemachandra subsequently notices many names of princes, familiar to the Hindus of other sects. He begins with Pṛithu son of Vena, whom he terms the first king: and goes on to Mándhátá, Hariśchandra, Bharata son of Dushyanta, etc. Towards the end of his enumeration of conspicuous princes, he mentions Karṇa, king of Champá and Anga; Hála or Śáliváhana; and Kumá[219]rapála, surnamed Chaulukya, a royal saint, who seems, from the title of Paramárhata, to have been a Jaina, and apparently the only one in that enumeration.

In a subsequent part of the same chapter, Hemachandra, (who was himself a theologian of his sect, and author of hymns

to Jina,[1]) mentions and discriminates the various sects; *viz.* 1st, Árhatas, or Jainas; 2ndly, Saugatas, or Bauddhas; and, 3rdly, six philosophical schools, *viz.* 1st. Naiyáyika; 2nd. Yoga; 3rd. Kápila or Sánkhya; 4th. Vaiśeshika;[2] 5th. Várhaspatya, or Nástika; and 6th. Chárváka, or Lokáyatika. The two last are reputed atheistical, as denying a future state and a providence. If those be omitted, and the two Mímánsás inserted, we have the six schemes of philosophy familiar to the Indian circle of the sciences.

The fourth chapter of Hemachandra's vocabulary relates to earth and animals. Here the author mentions the distinctions of countries which appear to be adopted by the Jainas; *viz.* the regions (*varsha*) named Bharata, Airávata, and Videha, to which he adds Kuru; noticing also other distinctions familiar to the Hindus of other sects, but explaining some of them according to the ideas of the Jainas. 'Áryávarta,' he observes, 'is the native land of Jinas, Chakrís, and Ardhachakrís, situated between the Vindhya and Himádri mountains.' This remark confines the theatre of Jaina history, religious and heroic, within the limits of Hindustán proper.

A passage in Bháskara's treatise on the sphere will suggest further observations concerning the opinions of the Jainas on the divisions of the earth. Having noticed, for the purpose of confuting it, a notion maintained by the [220] Bauddhas (whom some of the commentators, as usual among orthodox Hindus, confound with the Jainas,) respecting the descent or fall of the earth in space, he says,[3] 'The naked sectaries and the rest affirm, that two suns, two moons, and two sets of stars, appear alternately: against them I allege this reasoning. How absurd is the notion which you have formed of duplicate suns, moons, and stars; when you see the revolution of the polar fish.'[4]

[1] A commentary on these hymns is dated in S'áka 1214 (A.D. 1292); but how much earlier Hemachandra lived, is not yet ascertained. [Cf. Wilson, *Essays*, vol. v. p. 224.]

[2] [Or *Aulúkya*, cf. *Sarva Darś. S.* p. 103.]

[3] Goládhyáya, § 3, v. 8 and 10.

[4] Ursa minor.

The commentators[1] agree that the Jainas are here meant: and one of them remarks, that they are described as 'naked sectaries, etc.' because the class of Digambaras is a principal one among these people.

It is true that the Jainas do entertain the preposterous notion here attributed to them: and it is also true, that the Digambaras, among the Jainas, are distinguished from the Śuklámbaras, not merely by the white dress of the one, and the nakedness (or else the tawny apparel) of the other; but also by some particular tenets and diversity of doctrine. However, both concur in the same ideas regarding the earth and planets, which shall be forthwith stated, from the authority of Jaina books; after remarking, by the way, that ascetics of the orthodox sect, in the last stage of exaltation, when they become Paramahansa, also disuse clothing.

The world, which, according to the Jainas, is eternal, is figured by them as a spindle resting on half of another; or, as they describe it, three cups, of which the lowest is inverted; and the uppermost meets at its circumference the middle one. They also represent the world by comparison to a woman with her arms akimbo.[2] Her waist, or accord[221]ing to the description first mentioned, the meeting of the lower cups, is the earth. The spindle above, answering to the superior portion of the woman's person, is the abode of the gods; and the inferior part of the figure comprehends the infernal regions. The earth, which they suppose to be a flat surface, is bounded by a circle, of which the diameter is one *raju*.[3] The lower spindle comprises seven tiers of inferior earths or hells, at the distance of a *raju* from each other, and its base is measured by seven *rajus*. These seven hells are Ratna-prabhá, Śarkará-prabhá, Báluká-prabhá, Panka-prabhá, Dhúma-prabhá, Tama-

[1] Lakshmídása, Muníśwara, and the Vásanábháshya.

[2] The Sangrahaṇí-ratna and Lokanáb-sútra, both in Prákrit, are the authorities here used.

[3] This is explained to be a measure of space, through which the gods are able to travel in six months, at the rate of 2,057,152 *yojanas* (of 2000 *kros'a* each,) in the twinkling of an eye.

prabhá, Tamatama-prabhá.[1] The upper spindle is also seven *rajus* high; and its greatest breadth is five *rajus*. Its summit, which is 4,500,000 *yojanas* wide, is the abode of the deified saints: beneath that are five Vimánas, or abodes of gods: of which the centre one is named Sarvárthasiddha: it is encompassed by the regions Aparájita, Jayanta, Vaijayanta, and Vijaya. Next, at the distance of one *raju* from the summit, follow nine tiers of worlds, representing a necklace (*graiveyaka*), and inhabited by gods, denominated, from their conceited pretensions to supremacy, Ahamindra. These nine regions are, Áditya, Prítinkara, Somanasa, Sumanasa, Suvisála, Sarvatobhadra, Manoṛama, Supravaddha, and Sudarśana.

Under these regions are twelve (the Digambaras say sixteen) other regions, in eight tiers, from one to five *rajus* above the earth. They are filled with Vimánas, or abodes of various classes of gods, called by the general name of Kalpavásís. These worlds, reckoning from that nearest the earth, are, Saudhama[2] and Íśána; Sanatkumára and [222] Mahendra; Brahma; Lántaka; Śukra; Sahasrára; Ánata and Práṇata; Áraṇa and Achyuta.

The sect of Jina distinguish four classes of deities, the Vaimánikas, Bhuvanapatis, Jyotishís,[3] and Vyantaras. The last comprises eight orders of demigods or spirits, admitted by the Hindus in general, as the Rákshasas, Piśáchas, Kinnaras, etc., supposed to range over the earth. The preceding class (Jyotishís) comprehends five orders of luminaries; suns, moons, planets, constellations, and stars, of which more hereafter. The Vaimánikas belong to the various Vimánas, in the twelve regions, or worlds, inhabited by gods. The class of Bhuvanapati includes ten orders, entitled Asurakumára, Nágakumára, etc.; each governed by two Indras. All these gods are mortal, except, perhaps, the luminaries.

The earth consists of numerous distinct continents, in concentric circles, separated by seas forming rings between them.

[1] [*Tamaḥ-prabhá*, and *Mahátamaḥ-prabhá?*] [2] [*Saudharma?*] [3] [*Jyotishkas?*]

The first circle is Jambu-dwípa, with the mountain Sudarśa Meru in the centre. It is encompassed by a ring containing the salt ocean; beyond which is the zone, named Dhátukí-dwípa; similarly surrounded by a black ocean.[1] This again is encircled by Pushkara-dwípa; of which only the first half is accessible to mankind: being separated from the remoter half by an impassable range of mountains, denominated Mánu-shottara-parvata. Dhátukí-dwípa contains two mountains, similar to Sumeru, named Vijanga and Achala; and Pushkara contains two others, called Mandírá and Vidyunmálí.

The diameter of Jambu-dwípa being 100,000 great *yojanas*,[2] if the 190th part be taken, or $5\overset{y}{2}6\frac{6}{19}$, we have the breadth of Bharata-varsha, which occupies the southern segment of the circle. Airávata is a similar northern seg[223]ment. A band ($33648\frac{4}{19}$ *yojanas* wide) across the circle, with Sudarśa-meru in the middle of it, is Videha-varsha, divided by Meru (or by four peaks like elephants' teeth, at the four corners of that vast mountain) into east and west Videha. These three regions, Bharata, Airávata, and Videha, are inhabited by men who practise religious duties. They are denominated Karmabhúmi, and appear to be furnished with distinct sets of Tírthankaras, or saints entitled Jina. The intermediate regions north and south of Meru are bounded by four chains of mountains; and intersected by two others: in such a manner, that the ranges of mountains, and the intermediate valleys, increase in breadth progressively. Thus Himavat is twice as broad as Bharata-varsha (or $1\overset{y}{0}52\frac{12}{19}$); the valley beyond it is double its breadth ($2\overset{y}{1}05\frac{5}{19}$); the mountain Mahábimavat is twice as much ($4\overset{y}{2}10\frac{10}{19}$); its valley is again double ($8\overset{y}{4}21\frac{1}{19}$); and the mountain Nishadha has twice that breadth ($1\overset{y}{6}842\frac{2}{19}$). The valleys between these mountains, and between similar ranges reckoned from Airávata (*viz.* Śikharí, Rukmí, and Níla) are inhabited by giants (Yugala), and are denominated Bhogabhúmi. From either extremity of the two

[1] [Kálodadhi.]

[2] Each great *yojana* contains 2000 *kos*.

ranges of mountains named Himavat and Śikharí, a pair of tusks project over the sea; each divided into seven countries denominated Antara-dwípas. There are consequently fifty-six such: which are called Kubhogabhúmi, being the abode of evil-doers. None of these regions suffer a periodical destruction; except Bharata and Airávata, which are depopulated, and again peopled at the close of the great periods before mentioned.

We come now to the immediate purpose for which these notions of the Jainas have been here explained. They conceive the setting and rising of stars and planets to be caused by the mountain Sumeru: and suppose three times [224] the period of a planet's appearance to be requisite for it to pass round Sumeru, and return to the place whence it emerges. Accordingly they allot two suns, as many moons, and an equal number of each planet, star, and constellation, to Jambu-dwípa; and imagine that these appear, on alternate days, south and north of Meru. They similarly allot twice that number to the salt ocean; six times as many to Dhátukí-dwípa; 21 times as many, or 42 of each, to the Kálodadhi; and 72 of each to Pushkara-dwípa.

It is this notion, applied to the earth which we inhabit, that Bháskara refutes. His argument is thus explained by his commentators.

'The star close to the north pole, with those near it to the east and west, form a constellation figured by the Indian astronomers as a fish. In the beginning of the night (supposing the sun to be near Bharaṇí or Mushka), the fish's tail is towards the west, and his head towards the east; but at the close of the night, the fish's tail having made a half revolution, is towards the east, and his head towards the west; and since the sun, when rising and setting, is in a line with the fish's tail, there is but one sun; not two.' This explanation is given by Muníśwara and Lakshmídása. But the Vásaná-bháshya reverses the fish; placing his head towards the west at sunset, when the sun is near Bharaṇí.

VIII.

ON THE ORIGIN AND PECULIAR TENETS OF CERTAIN MUHAMMADAN SECTS.

[From the *Asiatic Researches*, vol. vii. pp. 338—344. *Calcutta*, 1801. 4to.]

[225] The Bohrahs,[1] numerous in the provinces of the Indian peninsula, but found also in most of the great cities of Hindustán, are conspicuous by their peculiar customs; such, for example, as that of wearing at their orisons an appropriate dress, which they daily wash with their own hands. Their disposition for trade to the exclusion of every other mode of livelihood, and the government of their tribe by a hierarchy, are further peculiarities, which have rendered them an object of inquiry, as a singular sect.

Researches made by myself, among others, were long unsuccessful. My informers confounded this tribe with the Isma'ílíyahs, with the 'Alí-iláhíyahs, and even with the unchaste sect of Charágh-kush. Concerning their origin, the information received was equally erroneous with that regarding their tenets. But at length a learned Sayyid referred me to the Majálisu'lmúminín composed by Núrullah of Shústar, a zealous Shí'ah, who suffered for his religious opinions in the reign of Jahángír. In the passage, which will be forthwith cited from that work, the Bohrahs are described by the author as natives of Gujrát, converted to the Muhammadan religion about three hundred years before his time, or five centuries ago.

[1] [Cf. Sir H. M. Elliot's *Races of N. W. Provinces of India*, vol. i. p. 43, and Sir J. Malcolm's *Central India*, vol. ii. p. 111.]

To that passage I shall subjoin extracts from the same [226] work, containing an account of similar tribes, with some of which the Bohrahs may, perhaps, have been sometimes confounded. Concerning the Isma'íliyahs, for whom they have been actually mistaken, it must be remembered, that these form a sect of Shí'ahs, who take their distinctive appellation from Isma'íl, eldest son and nominated successor of Imám Ja'far, surnamed Sádik. They consider Isma'íl as the true heir of the Imámat, and do not acknowledge the legal succession of his brother Músa' and of the five last Imáms. This sect flourished under the Egyptian dynasty of *khalífs* founded by Muhammad Mahdí, who claimed descent from the Imám Isma'íl himself. It was also conspicuous under a dynasty of princes of this sect, the first of whom, Hasan Sabbáh, founded a principality in Irák.[1] The sect may still exist in Syria; but it does not seem to be at present known in the Indian portion of Asia.

The 'Alí-iláhíyahs, on the contrary, are become numerous in India. This sect is mentioned by the author of the Dabistán, as prevalent in his time, only at Uzbíl, or Azbál, in the mountainous tract near Khatá. It now prevails, according to information which I have received, in a part of the dominions of Nawáb Nizámu'l-mulk. The singular tenets of this heretical sect are thus stated by Mohsin Fání. "The 'Alí-iláhíyahs hold, that celestial spirits, which cannot otherwise be known to mankind, have frequently appeared in palpable shapes. God himself has been manifested in the human form, but especially in the person of 'Alí Murtaza', whose image, being that of 'Alí Ullah, or 'Alí God, these sectaries deem it lawful to worship. They believe in the metem-

[1] See the *Dabistán* of Mullá Mohsin Fání; and D'Herbelot's *Bibliothèque Orientale*. If the industrious *Bohrahs* and the remorseless "assassins" had really arisen out of the same sect, it would be a new fact in the history of the human mind. [For the history of the Isma'íliyah, see Jourdain's paper on Mirkhond, *Notices et Extraits des MSS.* ix. pp. 143-183; Von Hammer, *Gesch. der Assassinen*; De Freméry, *Journ. Asiatique*, 1854, 1855.]

psychosis; and, like [227] others who maintain that doctrine, abstain from fleshmeat. They imagine, that 'Alí Murtaza', when he quitted this earth, returned to the sun, which is the same with himself; and hence they call the sun 'Alí Ullah. This sect does not admit the authenticity of the Korán, as it is now extant: some pretending, that it is a forgery of Abúbakr's, 'Omar's, and 'Othmán's; others condemning it simply because it was edited by the last-mentioned *khalíf*. The members of this sect appear to vary in regard to some points of doctrine; but the leading and universal tenet of this sect is, that in every age of the world, God is manifested in the persons of prophets and of saints; for instance, he was Adam, and afterwards Ahmad and 'Alí: and in like manner these sectaries believe in the transmigration of God into the persons of the Imáms. Some of them affirm, that the manifestation of the divine being, in this age of the world, was 'Alí Ullah; and after him, his glorious posterity: and they consider Muhammad as a prophet sent by 'Alí Ullah. When God, say they, perceived Muhammad's insufficiency, he himself assumed the human form for the purpose of assisting the prophet."[1]

It does not appear from any satisfactory information, that the Bohrahs agree with either of these sects, in deifying 'Alí, or in contesting the legal succession of the six last Imáms. On the contrary, the tribe is acknowledged to consist of orthodox Sunnís, and of true Shí'ahs; but mostly of the last-mentioned sect. These and other known circumstances corroborate the following account of that tribe, as given by Núrullah of Shústar, in the work before mentioned.

"The Bohrahs are a tribe of the faithful, which is settled chiefly at Ahmadábád and its environs. Their salvation in [228] the bosom of religion took place about three hundred years ago, at the call of a virtuous and learned man, whose name was Mullá 'Alí, and whose tomb is still seen at the city of Kambáyat.

[1] See the *Dabistán*, from which this account is abstracted. [Shea and Troyer's transl. vol. ii.]

"The conversion of this people was thus conducted by him: As the inhabitants of Gujrát were pagans, and were guided by an aged priest, a recreant, in whom they had a great confidence, and whose disciples they were; the missionary judged it expedient, first to offer himself as a pupil to the priest; and after convincing him by irrefragable proofs, and making him participate in the declaration of faith, then to undertake the conversion of others. He accordingly passed some years in attendance on that priest, learnt his language, studied his sciences, and became conversant with his books. By degrees he opened the articles of the faith to the enlightened priest, and persuaded him to become Musulmán. Some of his people changed their religion in concert with their old instructor. The circumstance of the priest's conversion being made known to the principal minister of the king of that country, he visited the priest, adopted habits of obedience towards him, and became a Muslim. But for a long time, the minister, the priest, and the rest of the converts, dissembled their faith, and sought to keep it concealed, through dread of the king.

"At length the intelligence of the minister's conversion reached the monarch. One day he repaired to his house, and, finding him in the humble posture of prayer, was incensed against him. The minister knew the motive of the king's visit, and perceived that his anger arose from the suspicion that he was reciting prayers and performing adoration. With presence of mind, inspired by divine providence, he immediately pretended that his prostrations were occasioned by the sight of a serpent, which appeared in the corner of the room, and against which he was [229] employing incantations. The king cast his eyes towards the corner of the apartment, and it so happened that there he saw a serpent; the minister's excuse appeared credible, and the king's suspicions were lulled.

"After a time, the king himself secretly became a convert to the Musulmán faith; but dissembled the state of his mind, for reasons of State. Yet, at the point of death, he ordered,

by his will, that his corpse should not be burnt, according to the customs of the pagans.

"Subsequently to his decease, when Sultan Zafar, one of the trusty nobles of Sultán Fírúz Sháh, sovereign of Dehlí, conquered the province of Gujrát; some learned men, who accompanied him, used arguments to make the people embrace the faith, according to the doctrines of such as revere the traditions.[1] Hence it happened, that some of the tribe of Bohrahs became members of the sect of the Sunnat.

"The party which retains the Imámíyah tenets comprehends nearly two thousand families. They always have a pious learned man amongst them, who expounds cases of law according to the doctrines of the Imámíyahs. Most of them subsist by commerce and mechanical trades; as is indicated by the name of Bohrah, which signifies merchant, in the dialect of Gujrát. They transmit the fifth part of their gains to the Sayyids of Madínah; and pay their regular eleemosynary contributions to the chief of their learned, who distributes the alms among the poor of the sect. These people, great and small, are honest, pious, and temperate. They always suffer much persecution (for the crime of bearing affection towards the holy family) from the wicked murderers,[2] who are invested with public authority; and they are ever involved in the difficulties of concealment.

[230] "The Sadíkíyahs[3] are a tribe of the faithful in Hindustán; pious men, and disciples of Sayyid Kabíru'ddín, who derived his descent from Ismáíl, son of Imám Jáfar. This tribe is denominated Sadíkíyahs, by reason of the sincere [*sadik*] call of that Sayyid. Although that appellation have, according to received notions, a seeming relation to Abúbakr, whose partisans gave him this title; yet it is probable that the sect assumed that appellation for the sake of concealment. However, no advantage ever accrues to them from it. On the con-

[1] The Sunnís, or orthodox sect. [2] The orthodox.

[3] [These are not the Sádikíyahs of the *Dabistán*.]

trary, the arrogant inhabitants of Hind, who are Hinduís, being retainers of the son of the impious Hind,[1] have discovered their attachment to the sect of Shí'ahs, and have revived against them the calumnies which five hundred years before they broached against the Ismá'ílíyahs. They maliciously charge them with impiety; such, indeed, is their ancient practice. They violate justice, and labour to extirpate this harmless tribe. In short, they cast the stone of calumny on the roof of the name and reputation of this wretched people, and have no fear of God, nor awe of his Prophet.[2]

"In short, nearly thirty thousand persons of this sect are settled in provinces of Hindustán, such as Multán, Láhor, Dehlí, and Gujrát. Most of them subsist by commerce. They pay the fifth part of their gains to the descendants of Sayyid Kabír, who are their priests; and both preceptor and pupil, priests and laymen, all are zealous Shí'ahs. God avert evil from them, and make the wiles of their foes recoil!

"The Hazárahs of Kábul are an innumerable tribe, who reside in Kábul, Ghaznín, and Kandahár. Many of them [231] are Shí'ahs, and adherents of the holy family. At present, among the chiefs of the Shí'ahs, is Mírzá Shádmán, with whom the faithful are well pleased, and of whose incursions the Khárijís[3] of Kábul and Ghaznín bitterly complain.

"The Balúch of Sind; many of these are devoted Shí'ahs. They call themselves, and are called by all the faithful, 'Alí's friends. Sayyid Ráju of Bokhárá exerted himself in the guidance of this tribe; his descendants remain among them, and are occupied with the concerns of the sect."

[1] Meaning Hindá the mother of Mo'áwiyah.

[2] The author proceeds in a strain of invective against the Sunnís; especially against Mullá 'Abdullah of Láhor, who bore the title of the Makhdúmu'l-mulk. This, being superfluous, is here omitted.

[3] The word is here used as a term of reproach; for its origin, as the appellation of a sect, see D'Herbelot's *Bibliothèque Orientale*.

IX.

TRANSLATION OF ONE OF THE INSCRIPTIONS ON THE PILLAR AT DELHI', CALLED THE LA'T OF FI'RU'Z SHA'H.

[From the *Asiatic Researches*, vol. vii. pp. 179—182. *Calcutta*, 1801. 4to.]

[232] SANSKRIT INSCRIPTION.[1]

संवत् १२२० वैशाख सुदी १५ शाकंभरी भूपति श्रीमद्वेल्लदेवात्मज श्रीमद्वीसलदेवस्य ॥

आविंध्यादाहिमाद्रेर्विरचितविजयस्तीर्थयात्राप्रसंगादुद्ग्रीवेषु प्रहर्ता नृपतिषु विनमत्कन्धरेषु प्रसन्नः ।

आर्यावर्तं यथार्थं पुनरपि कृतवान्म्लेच्छविच्छेदनाभिर्देवः शाकंभरींद्रो जगति विजयते वीसलः क्षोणिपालः ॥

ब्रूते संप्रति वाहमानतिलकः शाकंभरीभूपतिः श्रीमद्विग्रहराज एष विजयी संतानजानात्मजः ।

अस्माभिः करदं व्यधायि हिमवद्विंध्यान्तरालं भुवः शेषस्वीकरणाय मास्तु भवतामुद्योगशून्यं मनः ॥

शंभो नाम रिपुप्रियानयनयोः प्रत्यर्थिदंतान्तरे प्रत्यक्षाणि तृणानि वैभवमिदत्काष्टं यशस्त्रावकं ।

मार्गो लोकविरुद्ध एव विजनः शून्यं मनो विद्विषां श्रीमद्विग्रहराजदेव भवतः प्रयाणोत्सवे ॥

[233] लीलामंदिरसोदरेषु भवतु स्वांतेषु वामभ्रुवां शत्रूणां ननु विग्रह क्षितिपते व्याक्षस वासस्तव ।

शंका वा पुरुषोत्तमस्य भवतो नास्त्येव वारां निधेर्निर्मथ्यापहृतश्रियः किमु भवान्क्रोडे न निद्रायितः ॥

[1] See Plate i. [The plates are omitted in this edition.]

संवत्श्रीविक्रमादित्य १२२० वैशाखसुदी १५ गुरौ लिखितमिदं . . .
प्रत्यक्षं गौडान्वयकायस्थमाहवपुत्रश्रीपतिना अत्र समये महामंत्री राज-
पुत्रश्रीमल्लक्षणपालः ॥ श्रिवभयंकरचक्रवर्ती ॥

Samvat 1220 *vaiśákha sudi* 15 *śákambharí bhúpati śrímad vella devátmaja śrímad visala devasya.*

1 *A'vindhyád áhimádrer virachita-vijayas tírtha-yátrá-prasangád udgríveshu prahartá nṛipatishu vinamat-kandhareshu prasannaḥ*
áryávartam yathártham punar api kṛitaván mlechchhavichchhedanábhir devaḥ śákambharíndro jagati vijayate visalaḥ kshoṇipálaḥ.

2 *Brúte samprati báhujáta-tilakaḥ śákambharí-bhúpatiḥ śrímad vigraha-rája esha vijayí santánaján átmanaḥ*
asmábhiḥ karadam vyadháyi himavad-vindhyántarálam bhuvaḥ śesha-swíkaraṇáya mástu bhavatám udyogaśúnyam manaḥ.

3 *Ambho náma ripu-priyá-nayanayoḥ pratyarthi-dantántare pratyakshaṇi triṇáni vaibhava-milat-káshṭam yaśas távakam*
márgo loka-viruddha eva vijanaḥ śúnyam mano vidwishám śrímad vigraha-rájadeva bhavataḥ prapte prayáṇotsave.

4 *Lílá-mandira-sodareshu bhavatu swánteshu vámabhruvám* [234] *śatrúṇán nanu vigraha kshitipate nyáyyaś cha vásas tava*
śanká vá purushottamasya bhavato násty eva várán nidher nirmathyápahṛita-śriyaḥ kimu bhaván kroḍe na nidráyitaḥ.

Samvat śrí vikramáditya 1220 *vaiśákha sudi* 15 *gurau likhitam idam* . . . .
pratyaksham gauḍánwaya-káyastha-máhava-putra-śrípatiná atra samaye mahá-mantrí rájaputra śrímallakshaṇapálaḥ.

Verbal Translation.

"In the year 1220, on the 15th day of the bright half of the month Vaiśákha, [this monument] of the fortunate Vísala

Deva, son of the fortunate Vella Deva,[1] King of Śákambharí.

"As far as Vindhya,[2] as far as Himádri,[2] having achieved conquest in the course of travelling to holy places; resentful to haughty kings, and indulgent to those whose necks are humbled; making Áryávarta[2] once more what its name signifies, by causing the barbarians to be exterminated; Vísala Deva, supreme ruler of Śákambharí,[3] and sovereign of the earth, is victorious in the world.

"This conqueror, the fortunate Vigraha Rája,[4] king of [235] Śákambharí, most eminent of the tribe which sprang from the arms[5] [of Brahmá], now addresses his own descendants: 'By us the region of the earth between Himavat and Vindhya has been made tributary; let not your minds be void of exertion to subdue the remainder.'

"Tears are evident in the eyes of thy enemy's consort; blades of grass are perceived between thy adversary's teeth;[6] thy fame is predominant throughout space; the minds of thy foes are void [of hope]; their route is the desert where men are hindered from passing; O Vigraha Rája Deva, in the jubilee occasioned by thy march.

"May thy abode, O Vigraha, sovereign of the earth, be fixed, as in reason it ought, in the bosoms (akin to the

[1] Colonel Polier's transcript exhibited Amilla; the present copy may be read either Avella or Vella.

[2] The Vindhya hills form the range which passes through the provinces of Bihár, Benáres, etc. Himádri, the mountain of snow, (called Himavat in the next verse,) is the Imaus and Emodus of ancient geographers. A'ryávarta signifies the land of virtue, or "inhabited by respectable men." See Manu, ch. ii. v. 22.

[3] S'ákambharí is the modern S'ámbhar, famous for its salt lakes. It is situated at the distance of about thirty miles west of Jeypúr.

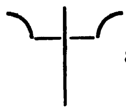
[4] Whether Vigraha Rája and Vísala Deva be names of the same person, or of different princes, it is impossible to determine from the tenor of the inscription, without other information.

[5] The transcript of the inscription exhibits *vdhamdna-tilakaḥ*, as it was also read in the former fac-simile: Sarvoru Trivedí advises me to read it *bdhujáta-tilakaḥ*, and I accede to his emendation. [See the note in the following page.]

[6] This alludes to the Indian custom of biting a blade of grass as a token of submission, and of asking quarter.

mansion of dalliance) of the women with beautiful eyebrows, who were married to thy enemies. There is no doubt of thy being the highest of embodied souls.[1] Didst thou not sleep in the lap of Śrí, whom thou didst seize from the ocean, having churned it?[2]

"In the year from the fortunate Vikramáditya 1220,[3] on Thursday the 15th day of the bright half of the month [236] Vaiśákha, this was written in the presence of[4] . . . . by Śrípati, the son of Máhava, a Káyastha of a family in Gauḍa: at this time the fortunate Lakshaṇapála, a Rájaputra, is prime minister.

"Śiva the terrible,  and the universal monarch."

There are on the same page, some short inscriptions, which I cannot decipher. One of them, however, is partly legible, and appears to be in the Hindustání language. It contains the name of Sultán Ibráhím, and wishes him a long life.

Note to the preceding Translation.

[From the *Asiatic Researches*, vol. ix. p. 445. *Calcutta*, 1807. 4to.]

A passage in the preface of the Śárngadhara-paddhati, and another in the body of that work, which were first indicated by Capt. Wilford,[5] show that a term contained in the inscription on the column at Delhí, for which I proposed to substitute, with the advice of the Paṇḍit who assisted me, the

[1] Sarvoru explains this very obscure passage otherwise: "there is (*i.e.* there should be) no doubt or hesitation in the mind of thee, who art the highest of embodied souls (Purushottama)."

[2] Purushottama is a title of Vishṇu. With reference to this term, the author of the inscription asks, "Art thou not Vishṇu himself? Art thou not he who slept in the arms of Lakshmí?" The legend of the churning of the ocean is well known.

[3] In the present copy the date is very distinct; and proves to be 1220; not 123,. as was suspected by Sir William Jones.

[4] This part of the inscription is not legible.

[5] As. Res., vol. ix. p. 189.

word '*báhujáta*' as a conjectural emendation, must be read '*cháhumána*,' or '*cháhavána*;' being the name of the tribe to which the prince, there mentioned, belonged, and which is well known at this day under the appellation of Chäuhán. In the preface, Śárngadhara describes himself as second in descent from Raghudeva, a priest attending on Hammíra, King of Śákambharí, of the tribe of Chäuhán, Cháhuván, or Báhuvána (for the name is variously spelt in different copies). The work itself is a compilation of miscellaneous poetry [237] arranged under distinct heads; and one chapter (the 73rd) is devoted to the admission of stanzas concerning individual princes. Among them two stanzas occur, which are there cited as an inscription on a royal column of stone, erected as a sacrificial pillar;[1] and which, on comparison, are found to be the same with the first two of the stanzas, on the pillar at Delhí. Several copies of the Śárngadhara-paddhati have been collated, in all of which the term in question is written Báhuvána. Comparing this with the preface of the same compilation, and with the inscription itself, we may be allowed to conjecture that Cháhuvána is the correct reading: the Nágarí letters ब and च being very liable to be confounded.[2]

[1] एतौ नृपतिपाषाणयज्ञयूपप्रशस्तेः ॥

[2] [For an account of the *S'árngadharapaddhati*, see Prof. Aufrecht's *Bodleian Catalogue*, p. 122. In the Bodleian MS., and in two of the India Office Library MSS., the name of the tribe is written *Cháhuvána*, in two it is written *Báhubána* or *Váhuvána*.]

X.

ON ANCIENT MONUMENTS, CONTAINING SANSKRIT INSCRIPTIONS.

[From the *Asiatic Researches*, vol. ix. pp. 398—444. *Calcutta*, 1807. 4to.]

[238] In the scarcity of authentic materials for the ancient, and even for the modern, history of the Hindu race, importance is justly attached to all genuine monuments, and especially inscriptions on stone and metal, which are occasionally discovered through various accidents. If these be carefully preserved and diligently examined, and the facts ascertained from them be judiciously employed towards elucidating the scattered information which can be yet collected from the remains of Indian literature, a satisfactory progress may be finally made in investigating the history of the Hindus. That the dynasties of princes who have reigned paramount in India, or the line of chieftains who have ruled over particular tracts, will be verified; or that the events of war, or the effects of policy, during a series of ages, will be developed; is an expectation which I neither entertain, nor wish to excite. But the state of manners, and the prevalence of particular doctrines, at different periods, may be deduced from a diligent perusal of the writings of authors, whose age is ascertained; and the contrast of different results, for various and distant periods, may furnish a distinct outline of the progress of opinions. A brief history of the nation itself, rather

than of its government, will be thus sketched; but if unable to revive the memory of great political events, we may at least be content to know what has been the state of arts, of sciences, of manners, in remote ages, among this very ancient and early civilized people; and to learn what has been the suc[239]cession of doctrines, religious and philosophical, which have prevailed in a nation ingenious yet prone to superstition.

Unfortunately, writers have seldom given the dates of their compositions; and the Hindu's love of fable, and distaste for sober narrative, have been as unfriendly to the biography of authors, as to the history of princes. The lives of few celebrated persons have been written; and those which have been composed exhibit the same fondness for improbable fiction which pervades the mythological works of the Hindus. The age of an author must be, therefore, sought from circumstances mentioned in his writings: and none more frequently affords the desired information than the author's notice of his patron; who generally is either the sovereign of the country, or some person standing in such relation to the court, as gives occasion to mention the name of the reigning prince. Thus every ancient monument which fixes the date of a reign, or determines the period of a particular dynasty, tends to the ascertainment of the age of writers who flourished in that reign or under that dynasty: and conversely, wherever dates can be, with confidence, deduced immediately from an author's works, these may furnish historical information, and assist the explanation of ancient monuments.

On this account the preservation and study of old inscriptions may be earnestly recommended. It is not on a first or cursory examination, that the utility of any particular monument for the illustration of the civil or literary history of the country can be certainly determined. Even those which at first sight appear uninteresting, may be afterwards found to bear strongly on an important point. Instances might be brought from the few inscriptions which have been already

published. But it is not my present purpose to enter on an examination of published monuments, but to urge the communication of every inscription [240] which may be hereafter discovered; at the same time that I lay before the Society copies and translations of those which have been recently communicated from various parts of India.

It is a subject for regret, that the originals, of which versions have before been made public, are not deposited where they might be accessible to persons engaged in researches into Indian literature and antiquities: but much more so, that ancient monuments, which there is reason to consider as important, have been removed to Europe before they had been sufficiently examined, or before they were accurately copied and translated. I may specify, with particular regret, the plate of copper found at Benares, and noticed by Capt. Wilford in the ninth volume of *Asiatic Researches* (p. 108); and still more a plate which has been mentioned to me by a learned Paṇḍit (who assured me that he was employed in deciphering it),[1] and which appears, from a copy in his possession, to have contained a grant of land by the celebrated Jayachandra, when a young prince associated to the empire of his father; from this information it seems to have been particularly valuable, on account of the genealogy comprised in it.

Translations might indeed be made from the Paṇḍit's copy of the last-mentioned plate, and from one taken by a learned native in Capt. Wilford's service, from the plate discovered at Benares. But my experience of the necessity of collating the copies made by the best Paṇḍits, from inscriptions in ancient or unusual character, discourages me from placing implicit confidence in their transcripts; and the originals are at present beyond reach of [241] reference, having been conveyed to Europe to be there buried in some public museum or private collection.

[1] Sarvoru Trivedí; the same who assisted me in deciphering the copy of an inscription on Fírúz Sháh's pillar at Delhí. As. Res. vol. vii. p. 180. [Pages 208–212 of the present volume.]

The only amends, which could be now made for the removal of those interesting monuments, would be the publication of copies correctly made in fac-simile. From such transcripts, provided they be executed with great care, the text may be deciphered and translated. An exact copy of the Sanskrit inscription on the stone at Cintra in Portugal, enabled Mr. Wilkins to ascertain the date and scope of that inscription; as well as the names, which it contains.[1] Similar copies of other inscriptions would, in like manner, furnish Oriental scholars with the means of ascertaining their purport; and the publication of fac-similes may, for this purpose, be recommended to those who are in possession of the originals.

I now proceed to describe, and, so far as I have succeeded in deciphering them, to explain, the several inscriptions on ancient monuments in stone and copper, which have been lately presented to the Asiatic Society.

I. *Inscription on a Plate of Copper found in the District of Tipura.*

Towards the end of 1803, a plate of copper was discovered in digging earth for the repair of the highway through the Manamatí hills in the district of Tipura. It was carried to Mr. Eliot, magistrate of the district; and by him communicated to the Asiatic Society. On examination, it has been found to contain an inscription declaratory of a grant of land, dated near 600 years ago.

The plate measures eleven inches in height and nine in breadth, and is engraved on one surface only. The sides [242] have a gentle curvature; and, at top, is an abrupt bend, allowing room to a figure coarsely delineated, and apparently intended to represent a temple. The character agrees nearly with that now in use in Bengal: but some of the letters bear a closer resemblance to the writing of Tirhút.[2]

[1] Murphy's *Travels in Portugal*, p. 277.

[2] There is reason to suppose the writing, as well as the language, of Bengal, to

The following is an exact copy of the inscription in Nágarí letters, as deciphered by the aid of several Paṇḍits. A literal translation is subjoined; and a fac-simile of the original is exhibited in the annexed plate.[1]

॥ श्री ॥

तस्मिन्नुर्व्वीरमणिनकुले विश्वविख्यातकीर्त्ति-
र्विद्याधारः परमसुकृती मण्डनं पण्डितानां ।
ख्यातः श्रीमानजनि स महान् हेण्डि एवाभिधानो
यस्य स्वच्छे व्यचरदनिशं मानसे धर्म्महंसः ॥ १ ॥
तस्मादभूदमलकीर्त्तिकलावितानः
श्रीमानमात्यतिलको मनुजामलेन्दुः ।
दृष्ट्वा शशी तमिति यत्स्फुटपुण्यशाखा-
ह्ज्याबजी श्यपुमानिव संविभाति ॥ २ ॥
अविरहात्स महाश्वनिबन्धिकः
परमतत्त्वमहत्त्वमधिष्ठितः ।
[243] रुचिररीतिषु गीतिषु गीष्पतिः
सहजधर्मसु कर्मसु शोभते ॥ ३ ॥
दानध्यानमहोदधिः प्रविचलच्चित्तैककारागृहं
तच्छास्वाद्तृषामयः कृतिहृद्याधारः परप्राणिनां ।
धर्म्मख्यातुलकेलिसद्मसु छती गुप्तैकयोगीश्वरः
सोऽयं श्रीधण्डि एव एक उदभूदानन्दचन्द्रो भुवि ॥ ४ ॥
यश्चैवाश्वनिबन्धिकोऽयमभवत्सोऽपीन्द्रचूडामणे-
स्तस्य श्रीरणवङ्कमल्लनृपतेर्लीलापि लोकोत्तरा ।
आक्रामन्निरितस्ततस्त्रिजगतीं यत्तद्यशोभिः सितैः
प्रासादेऽपि शिवे सहस्रनयनो जातानुलोमाचितः ॥ ५ ॥
दुर्गोत्तारा विहारीरचिरविरचिता पद्धिकेवाननद्या[2]
येयं धर्मस्य कामं मुकुटविरचनाप्रक्रियेवाभिभाति ।

be originally the same with the Tirhútíya: altered, in course of time, since the separation which has been the consequence of a colony of Kányakubja Bráhmans settling in Bengal.

[1] [The plates are omitted in this edition.]

[2] [-नगर्य्यां ?]

ग्रामेऽद्वीवेजखण्डे निजसरजहृदा विंशतिद्रोणभूमि-
र्दत्ता चन्द्रार्कमाशामतिविमलयशःशङ्खसम्यक्कृषिश्च ॥ ६ ॥
युक्तस्तस्य कीर्त्तेर्यत्सर्वत्र भवति भ्रमः ।
दत्ता दृषिणचित्तेन चतुःसीमेति भूः स्वयं ॥ ७ ॥
हंहो बोधत भाविभूमिपतयो यत्नाग्रपत्राङ्कुरं
युष्मानस्मिनयान्वितोऽयमधुना कृताञ्जलिर्याचते ॥
पाल्या भूमिरियं न वा कतिपयद्रोणेष्व राज्यस्थिति-
र्धिग्दैन्यं विधवेव सा वसुमती यस्या लघीयान्पतिः ॥ ८ ॥
[244] सहजगुणमहिम्ना यत्रपीयं स्वभावा-
दतिविलसति गुप्ता वंशजानां प्रशस्तिः ।
विमलकुलगुणौघैर्गाढमाकृष्यमाणः
प्रकटयति तदित्थं मेदिनी एव एषः ॥ ९ ॥
शकनृपतेरतीता अब्दाः ११४१ रणवङ्कमल्लश्रीम-
त्हरिकालदेवपादानां सप्तदशसम्वत्सरेऽभिलि-
ख्यमाने यत्राङ्केनापि सम्वत् १७ सूर्यगत्या[1] तुलदिने २६ ॥

TRANSLATION.

1. "In that[2] eminent and spotless family, was born, an ornament of the learned, renowned throughout the world, endowed with science, and practising good deeds, the celebrated, happy, and venerable Heḍi;[3] in whose pure mind, virtue ever ranges, like a swan in the limpid lake.

2. "From him sprung the happy chief of ministers, who exhibits the joys of unsullied glory; a spotless moon among mortals, and at sight of whom the hare-spotted luminary[4]

[1] [In the plate two letters seem to intervene between *gatyá* and *tula*.]

[2] This use of the pronoun indicates the conspicuousness of the object; as if sufficiently known without further designation.

[3] Here, as well as with the subsequent names, the particle *eva* is subjoined without changing the preceding vowel. This is contrary to the rules of the language, and emendations have been accordingly proposed: but I shall not disturb the text.

[4] The moon is named S'as'in, from a fancied resemblance of its spots to a leveret. Paṇḍits, to whom I showed maps of the moon, copied from Hevelius and Ricciolus, fixed upon the Loca Paludosa and Mons Porphyrites, or Keplerus and Aristarchus, for the spots, which, they think, exhibit the similitude of a hare.

appears swoln [with envy], and distempered with alternate increase and wane.

[245] 3. "That venerable officer,[1] ever relying on holy virtues,[2] is eminently conversant with well-guided morals, and conspicuous for the observance of practical duties.

4. "Himself an ocean of generosity and meditation, yet thirsting to taste, by practice of austerity, that which alone confines the fleeting thoughts;[3] sympathizing with other living beings, an unrivalled theatre of virtue, practising good deeds, and, in private, only a contemplative saint, this auspicious Dhaḍi alone rose, as a luminary of joy above the earth.

5. "Superior to the world was the delight of this pre-eminent sovereign of the earth, the happy Raṇabanka-malla, whose officer[4] he was; for the deity who has a hundred eyes[5] is obscured, even in his own abode, by the dazzling glories of that [monarch], which traverse the three worlds, in all directions.

6. "May the twenty *droṇas*[6] of land, in the village of Ijakhaṇḍa, granted to him by that generous prince, continue as long as sun and moon endure, yielding the ample [246] harvest of unsullied praise; for it is land secure from invasion, delightful, like a pleasant painting, and appears like a crest in the assemblage of cities.

7. "This land, with definite boundaries, has been given by

[1] The term is Aśwanibandhika, which the Paṇḍits are disposed to explain as signifying "a general commanding cavalry." Other interpretations may be suggested: the word is an unusual one.

[2] This, as indeed the whole of the verse, is obscure, and admits of various interpretations. In this place, more than one reading has been proposed.

[3] Here again the sense is obscure; and more than one reading may be proposed. The praise is evidently grounded on the union of practical virtues with religious contemplation.

[4] Aśwanibandhika.

[5] Indra.

[6] A measure of land, still used in the eastern parts of Bengal, originally as much as might be sown with one *droṇa* of seed: for a *droṇa* is a measure of capacity. (As. Res., vol. v. p. 96.) The *droṇa*, vulgarly called *dún*, varies in different districts. It may, however, be reckoned nearly equivalent to eight *bighas*, or two acres and two-thirds.

the liberal prince himself, the range of whose glory therefore extends, as is fit, in all directions.

8. "O future kings; understand this inscription on copper, by which that officer[1] humbly now solicits you: this land should be preserved; nor is the permanence of the realm consistent with the slightest injury: a shame on avarice! That land is, as it were, a widow, the sovereign of which is despised [for his covetousness].

9. "Although this excellence of the descendants [of that prince] which is guarded by their natural virtues, be sufficiently apparent, yet does Mediní, urged by the multitude of the good qualities of that unsuilled race, thus make it known.[2]

"Years expired of the Śaka king 1141;[3] dated in the seventeenth year of Raṇabanka-malla, Śrímat Harikála-deva,[4] or expressed in numerals, Samvat,[5] 17; on the 26th of the Sun's being in the balance."

[247] II. *Inscription on a Plate of Copper found in the District of Gorakhpur.*

A plate of copper, containing an inscription in the Sanskrit language, declaratory of a grant of land, but without date, was lately found in the district of Gorakhpur, near the river called the little Gandhak. It was brought to Mr. John Ahmuty, magistrate of the district, and by him communicated to Captain Wilford, who has presented it to the Asiatic Society.

The plate, which is 16½ inches long, and 12½ broad, is engraved on one face only. The lines, of which there are 24, run

[1] Aśwanibandhika.

[2] This inscription appears not to be a grant by the sovereign; but a memorial of the grant recorded by the possessor, who must have been the heir of the grantee, and who seems to acknowledge in this place the liberality of the grantor's successors continuing the land to him.

[3] Corresponding to A.D. 1219.

[4] This prince is probably a different person from the grantor named in the fifth verse.

[5] Here Samvat is used for the year of the king's reign. See remarks, towards the close of this paper, on an inscription found at Ámgáchhi in Dinájpur.

in the length of the plate; and on the left side is a curvature, on which a semicircular appendage is riveted, containing a flat button representing the impression of a seal. The figure is very imperfect, but seems to be intended for some animal.

With the plate itself, Captain Wilford communicated a copy of its contents as deciphered by a Paṇḍit in his service. On carefully comparing it with the original, I found all the essential passages, as well as the names, correctly given: a few alterations, which this comparison showed to be necessary, have been made with the concurrence of several Paṇḍits from Tirhút, who assisted me in collating it. I preferred the aid of Paṇḍits of that province, because the peculiarities of the characters where they differ widely, as they do in many instances, from common Devanágarí, make a nearer approach to the Tirhútíya letters than to any other now in use. The whole inscription is indeed remarkable for the uncommon form of the consonants, and the very unusual manner in which the vowels are marked. On this account an exact copy of the original in fac-simile will be subjoined;[1] as well as a correct [248] transcript in modern Devanágarí letters. The following version is as literal as the difference of idiom permits.

Translation.

1 "Salutation to the God, who is manifested in various forms, from earth to the performer of a sacrifice,[2] who is an universal soul, to be apprehended only by contemplation of saints; and who pervades all.

2. "Salutation to the unborn God,[3] who makes the world's production, its continuance, and ultimate destruction; and the recollection of whom serves as a vessel of transport across the ocean of mundane ills.

3. "Salutation be to the husband of Lakshmí; to him

[1] See plate iii. [omitted in this edition].

[2] S'iva, manifested in eight material forms: *viz.* Earth, Water, Fire, Air, Ether, the Sun, the Moon, and the person who performs a sacrifice.

[3] Brahmá the creator, himself not created, and therefore termed unborn.

who reposes on Śesha as on a couch; to him who is Vishṇu extracting the thorns of the three worlds; to him who appears in every shape.[1]

4. "Salutation be to the blessed foot of Párvatí,[2] which destroyed the demon Mahisha, by whom all had been overcome; and which gives felicity to the world.

5. "Surrounded by groves of lofty canes,[3] inaccessible through the range of edifices on the hill's summit; encompassed by a deep ditch, in which fountains spring; secure by impassable defence from dread of foes, a [249] royal
6. abode there is named Vijayapura,[4] which is situated on the declivity of the northern mountain, where the pain of regret is unknown, and every gratification is found.

7. "There reigned the fortunate Dharmáditya, like another Bodhisattwa, a mighty and prosperous prince, whose glory spread over the four seas. His son was
8. Jayáditya,[5] adorable like the moon, the fortune of the world, like the tree which bears every desired fruit, and satisfying thirst like a deep lake; humble, though a king;
9. though young, prudent and averse from amorous passion; though liberally bestowing all, yet ever receiving the best result of all.

10. "His minister, learned, intelligent, and vanquisher

[1] Vishṇu, who reposes on the serpent Ananta or S'esha; and who has been incarnate in various shapes, to relieve the world from oppressors.

[2] Bhavání or Durgá slew Mahisháśura. The legend is well known.

[3] Bamboos (*Bambusa arundinacea* and other species).

[4] The place here described may be Vijey-pur, on the northern declivity of the Vindhya hills, a few miles from the temple of Vindhyá-vásiní near Mírzápur on the Ganges. It is the ancient residence of a family, which claims descent from the former sovereigns of Benares; and is still the abode of the head of that family. But the terms of the text, Uttaragiri-kaṭake, rather seem to signify 'declivity of the northern mountain,' than 'northern declivity of the mountain;' and that interpretation points to the range of snowy mountains, instead of Vindhya, which is reckoned a tropical range.

[5] The name of Jayáditya is known as the patron of certain authors who flourished at Kás'í; and who are considered as ancient writers. He is mentioned in the title of the Vámana-kás'iká, and even termed the author of that grammatical work. I shall not undertake to determine whether this be the same person.

of foes, the son of a mighty chieftain and counsellor Kritakírti, was the fortunate Madáli,[1] [250] whose pleasing
11. counsels obtained a ready hearing, and who was by nature eager for the reduction of enemies.[2]

12. "The village of Dummadumá,[3] obtained by him from the royal favour, and rich in tillage, dwellings, and cattle, has been assigned by him to Durgá.[4]

13. "The opulence of the good, who put their trust in the great, is, indeed, beneficial to others: the clouds gather water from the sea, and shower it down on the growing crop.
14. Rare indeed are those liberal persons, who distinguish not between their own dependents and strangers: how many are the all-productive trees even in the celestial grove?[5]

15. "Do not imagine, father,[6] that, in the sinful age, a general equality prevails: the sovereign defends the earth,
16. but a weak individual guards not even his house.[7] Birth and death, success and misfortune, are perpetually passing: why not, therefore, protect another's glory like one's own?

[1] The names, being uncommon, are, in this instance, doubtful. S'rímadáli is clearly given as the name of the minister: and either the whole of it may be his name; or it may be resolved into S'rímat A'li, or into S'rí Madáli. The latter is most agreeable to the prevailing practice of prefixing S'rí to a proper name. In this inscription, the auspicious syllable is prefixed to the names of the two kings first mentioned; but is not added to the names of the writers of it, who are noticed towards the close. (v. 20 and 22.)

Kritakírti may signify 'of established fame:' but, if taken as an epithet, it leaves no other term which can be assumed as the name of the minister's father.

[2] The text exhibits *Prakritiparabaddhakaksho.* Though a very unsatisfactory reading, it is here preserved, and has been translated in the most probable sense which I am able to suggest for it. [Should it not be *prakritiparabaddhakakaksho ?*]

[3] A village of this name is situated in the district of Allahábád, within twenty miles of Bijeypur on the Ganges. But the name is not uncommon: and may belong to some place nearer to the northern mountains.

[4] Jayáditya's minister, Madáli, appears to have assigned this village for general charitable uses, by consecrating it to the goddess Durgá. Such at least seem to be the most consistent reading and interpretation of the text.

[5] Indra's garden called Nandana; in which five celestial trees are placed, termed Kalpadruma, Párijáta, etc. The Kalpadruma yields, as its fruit, everything which is desired.

[6] [*Táta* may also mean 'son,' as addressing a future generation.]

[7] The intention of this and the following lines is to deprecate the resumption of the grant.

17. He, who bestows fertile land [251] furnished with the means of agriculture, mounts a celestial vehicle, and
18. ascends to heaven, gladdening his progenitors. But he, who foolishly resumes land allotted to gods or priests, assuredly causes his ancestors to fall to hell, even though they had previously attained heaven.

19. "Sprung from a very pure race, respectful towards gods, priests, spiritual parents, and the king, a generous
20. founder of temples, who has dug many ponds; by the tenderness of his disposition an image of Sugata,[1] a treasure of virtues, with subdued organs, wise, and averse from unpleasing discourse: such was the Káyastha Nágadatta.
21. By him was composed with great devoutness, this praise of the minister; in apt measure and pleasing verse, elegant[2] and apposite.

22. "The last three verses were written by his younger brother Vidyádatta; for he himself was fearful of proclaiming his own virtues.

23. "Rich and fertile is the village, obtained through [252] the king's favour as an endowment for subsistence, and still more productive is this other village for virtuous men."[3]

[1] From this comparison to Sugata or Buddha, as well as a previous comparison to a Bodhisattwa, it may be inferred that the author, if not himself a follower of the sect of Buddha, was at least more amicably disposed towards that sect than modern orthodox Hindus appear to be.

It is hardly necessary to inform the reader, that the last Buddha was conspicuous for his tender, compassionate disposition. The mythology of the sect of Buddha peoples heaven with Bodhisattwas; and, from this class of beings, the Buddhas are selected. Gautama Buddha was a Bodhisattwa under the name of S'wetaketu, before he was incarnate as Siddhártha, son of S'uddhodana.

[2] The text exhibits Surṇa-kṛitaśobhá; which must be amended by reading either Swarṇa or Suvarṇa. The last is preferable as giving the most correct metre: either way the meaning is rendered 'elegant as gold,' or 'by well selected words:' for *suvarṇa* or *swarṇa* signifies gold; and may be resolved into two words, *su* 'well,' and *varṇa* or *arṇa* a 'letter' or 'syllable.'

[3] The last line is very obscure. If it have been rightly deciphered and explained, it may allude to some other grant held by the Rájá's minister, for his own subsistence.

॥ श्रीगणेशाय नमः ॥

क्षित्यादियजमानात्ममूर्तये विश्वगात्मने ।
मुनीनां ध्यानगम्याय समस्तव्यापिने नमः ॥ १ ॥
अजाय जगदुत्पत्तिस्थितिप्रलयकारिणे ।
संसारसागरोत्तारपोतसंभूतये नमः ॥ २ ॥
नमोऽस्तु लक्ष्मीपतये शेषपर्यङ्कशायिने ।
त्रैलोक्यकंटकोत्खातिविष्णवे विश्वरूपिणे ॥ ३ ॥
नमोऽस्तु विजिताशेषमहिषासुरघातिने ।
पार्वतीपादपद्माय जगदानन्ददायिने ॥ ४ ॥
वेणुवनालीविषमा शिखरप्राकारमालयालंघ्या ।
निर्झरगभीरपरिखा दुस्तरमत्यारिसंत्रासा ॥ ५ ॥
अविदितवियोगदुःखा सन्तोषसमाप्तसकलविषयसुखा ।
अस्त्युत्तरगिरिकटके विजयपुरं नाम नृपधानी ॥ ६ ॥
तत्र च चतुरम्भोधिख्यातयशाः स्थिरोदयो महासत्वः ।
श्रीमान्धर्मादित्यो नृपतिरभूद्बोधिसत्व इव ॥ ७ ॥
[253] तस्य च शशीव सेव्यो भाम्यं लोकस्य कल्पशाखीव ।
इन्द्र इव तृष्णापहरः सुतोऽभवच्छ्रीजयादित्यः ॥ ८ ॥
राजापि यो विनीतो युवापि धीरो मनोभवद्वेषी ।
सर्वप्रदोऽपि शश्वत्सर्वस्य गृहीतपरमार्थः ॥ ९ ॥
तस्य सचिवः श्रुतार्थो महानुभावो विनिर्जितारातिः ।
सामन्तस्य सुमहतः कृतकीर्त्तेर्भचिवस्तनयः ॥ १० ॥
यस्य च सुचारुमंत्रे दूरतः वर्णोऽपि लाघवं यातः ।
प्रकृतिपरञ्जकेशो बभूव स श्रीमहाजिरिति ॥ ११ ॥
कुम्भकुमारनामा ग्रामो राजप्रसादसंप्राप्तः ।
कृषिवसतिगोधनाढ्यो दुर्गायै शासितस्तेन ॥ १२ ॥
भवति हि सतां विभूतिः परोपकृतये महान्तमाश्रित्य ।
जलधेरादाय जलं जलदाः शस्याय वर्षन्ति ॥ १३ ॥
स्वपरजननिर्विशेषाः सन्तो विरला हि संति फलदाने ।
कल्पद्रुमाः कियन्तः श्रूयन्ते नन्दनेऽपि वने ॥ १४ ॥

मा कलय कलियुगेऽपि हि समागतां तात सर्वसत्त्वेन ।
रक्षति वसुधां नरपतिरात्मगृहं नैव लघुसत्त्वः ॥ १५ ॥
जन्म मरणं च संपद्विपच्च पुंसां सुशाश्वती भवति ।
यदि चैवं परकीर्त्तिं स्वामिव कथान्न पालयेत् ॥ १६ ॥
कृषिकारणसंयुक्तां वसुन्धरां यो ददाति शस्यवती ।
[254] व्रजति विमानारूढः पितॄन् स चाह्लादयन्नाके ॥ १७ ॥
अपहरति यो विमोहाद्देवद्विजपादकल्पितां वसुधां ।
स्वर्गस्थानपि नियतं पातयति स पूर्वजान्नरके ॥ १८ ॥
अतिनिर्मलकुलजन्मा देवद्विजगुरुनरपतिनतिसक्तः ।
स्थानितभूरितडागः कारितदेवालयस्वामी ॥ १९ ॥
सुगतप्रतिमः कृपया गुणनिधिरभवज्जितेन्द्रियो विद्वान् ।
विप्रियवादे विमुखः कायस्थो नागदत्त इति ॥ २० ॥
सचिवस्य तेन रचिता लक्षणयुक्ता सुवर्णकृतशोभा ।
सद्वृत्ता ललितपदा भक्त्या परया प्रशस्तिरियं ॥ २१ ॥
स्वगुणज्ञापनभीरोस्तस्य भ्रात्रा कनीयसा रचितं ।
आर्याणां त्रितयमिदं विद्यादत्तेन भूतार्थं ॥ २२ ॥
राजप्रसादलब्धा धनकनकसमाकुलातिसस्यवती ।
जीवनपल्लिरिति सतां ग्रामोऽयं सस्यतरः परः ॥ २३ ॥

III. *Inscription on three Plates of Brass found at Chitradurg.*

A grant of land, engraved on three plates of brass, which were found at Chitradurg in the year 1800, and a fac-simile of a similar grant found at the same place, have been presented by Major C. Mackenzie to the Asiatic Society.

[255] The plates, which appear to be very similar in both grants, may be described from that, of which the original has been received. They are nearly seven inches wide and as many high, but surmounted by an arch of two inches in height. The two exterior plates have been engraved on the inner side only: the middle one is so on both faces. At the

edge is a rim, half a line thick, by which the inscription is secured from being effaced by the rubbing of the plates. They are held together by a brass ring, on which is a seal of the same metal representing a boar. The engraved surfaces have some appearance of having been once gilt.

The language is Sanskrit, excepting the description of the lands, which is in the Kánara dialect. The whole inscription is in Devanágarí characters: but some of the letters are formed in a very unusual manner. It contains a grant by the king of Vidyánagar (pronounced Bijánagar), formerly the capital of Karṇáṭaka: and is dated little more than four hundred years ago. Grants, by kings of this dynasty, are not uncommon in the Dakhin; and may be of use in determining the dates of their several reigns. These princes were enlightened patrons of science; especially Harihara and Bukkaráya, sons of Sangama the founder of the dynasty.

Major Mackenzie forwarded a translation of this inscription made by his interpreter Kavelly Boria. The original is, in some instances, read differently by the Paṇḍits whom I have consulted; not, however, making any change in the purport, nor in any material passage. The following translation is conformable to their interpretation: and the copy, which is subjoined, exhibits the text as read by them.

[256] TRANSLATION.

1. "Salutation to Gaṇeśa. I bow to Śambhu, graced with the beautiful moon crowning his lofty head; himself the pillar, which upholds the origin of the three
2. worlds.[1] May he, whose head is like an elephant's, the

[1] S'iva, or Mahádeva, is figured with the moon as a crest. According to mythology, he upholds the creator.

This, and the two following stanzas, seem to be the same which are found, but in a different order, at the beginning of the inscription on the plates preserved at the temple of Konjeveram (As. Res., vol. iii. p. 39); with some difference, however, in the reading and interpretation.

son of Hara,[1] the cause of uninterrupted supremacy, the giver of boons, and the luminary which dispels darkness,[2]
3. preserve us. May the auspicious primeval boar,[3] by whom, closely embraced, the earth exults, grant us vast prosperity.

4. "The ambrosial moon, brother of the goddess Ramá, is the offspring of the milky ocean,[4] having a common origin with the gem Kaustubha, the all-productive tree
5. and the ever-beneficent cow. In the lunar race was born a king named Yadu,[5] by a descendant of whom [Kṛishṇa]
6. son of Vasudeva, the earth has been protected. In his line arose a king named San[257]gama,[6] who abounded in weighty virtues, and shunned the society of the wicked.

7. "This king had [five] sons, Harihara, Kampa, Bukkaráya who was sovereign of the earth,[7] Márapa and Mudgapa.

8. "Among these five graceful princes, the most celebrated was Bukka, sovereign of the earth, conspicuous for
9. valour, as Arjuna among the Páṇḍavas. Therefore, did Bukkaráya, fierce in battle, become a fortunate prince, applying his left shoulder[8] to uphold the burden of the mighty elephants posted at the quarters of the world.

[1] Gaṇeśa, figured with an elephant's head, reckoned son of Hara or Mahádeva and of his wife Párvatí.

[2] The original is here inaccurate: it exhibits *Taras tívra timira gihiro;* which means nothing, and in which a syllable is deficient for the metre. In the facsimile of another grant, the same passage is correctly written, *Varadas tívra timira mihiro.*

[3] The incarnation of Vishṇu, as a boar, who upheld the earth submerged by the ocean, is well known to all who are conversant with Indian mythology.

[4] The story of the churning of the ocean is familiar to every one.

[5] Yadu, the celebrated ancestor of Kṛishṇa, was of the lunar race.

[6] The pretensions of Sangama to be descended from the lunar line of Kshatriyas or Chandravanśís are here asserted.

[7] The names of three of these princes, as well as of their father, occur in the writings of Mádhava-áchárya, and of his brother Sáyaṇa-áchárya, who were priests and counsellors of those monarchs.

Harihara Rája, and Bukkana Rája or Bukkaráya, are named in Mádhava's commentary on the Vedas, and Kampa is mentioned in his grammatical works.

[8] The text appears to exhibit the negative of *dakshiṇa* 'right.'

At the eight principal points of the compass, elephants uphold the world.

10. When his army, in warlike array, performed evolutions on the frontier of his dominions, the Turushkas felt their mouths parched; the Konkaṇa, terrified, apprehended impending death; the Andhras fled, in consternation, to the caverns; the Gurjaras trembled; the Kámbojas lost their firmness; and the Kalingas were quickly discomfited.[1]

[258] 11. "He was a conspicuous monarch, splendid, and a supreme ruler of kings, but acting towards disobedient
12. princes, as the king of birds towards serpents: embraced by the concubines of kings, destroying hostile chiefs, defending the heroes of Hindú-ráya, endowed with knowledge and other qualities.[2]

13. "By that victorious king was Vidyá-nagarí made a permanent metropolis; a fortunate city, which is adapted to promote universal conquest.[3]

14. "Gaurámbiká became his queen; a princess respectable for her virtues; as Ramá the beloved wife of
15. Kṛishṇa; as Gaurí, of Śiva; as Śachí, of Indra; as
16. Saraswatí, of Brahmá; as Chháyá, of Súrya.[4] By the

[1] This verse is extremely inaccurate in the original: it has been corrected with the aid of the fac-simile of another grant before mentioned. It begins, *Yasyoddhaya yuddhe yuddha range*, which is unmeaning and contains too many syllables for the metre. It should be, as in the other inscription, *Yasyodyad yuddha range*. A syllable is wanting in *Turushkáḥ*, written *Tushkáḥ*. Two were deficient in *Bhaya bhara bharitaḥ*, expressed *Bhava bharitaḥ*. Both inscriptions write *Kámbhojáḥ* for *Kámbojaḥ*. In one, *Sapari* is erroneously put for *Sapadi*.

All the names of nations, which occur in this place, have been repeatedly explained.

[2] These stanzas are very obscure: and I am not confident that they are rightly translated. Hindú-ráya seems to be similar to the Hindúpati of Bundelkhand: for so the government of that country was denominated under the chiefs, who ruled it in the last and in the preceding century.

The stanzas appear to be similar to two in the grant preserved at Konjeveram: *viz.* 25th and 26th. (As. Res., vol. iii. p. 47.) But there is some difference in reading as well as interpretation.

[3] Vidyá-nagarí signifies the city of science. Farishtah was mistaken, when he affirmed, that it was founded by Rájá Ballál-deo and named after his son Bíjáráy. (Scott's *History of Dekhan*, Intr. p. xi.) It is believed to have been founded by the two brothers Harihara and Bukkaráya.

[4] The gods and goddesses, to whom this happy couple is here compared, are mentioned in the text by titles, some of which are uncommon; and have been

charms of her graceful gaiety, [259] she obscured Tilottamá;[1] by her happy fidelity to her husband, she excited the envy of Anasúyá.[2]

17. "This liberal prince, pre-eminent among kings, beget, on that divine princess,[3] a son named Harihara:
18. who is become a protector of the good and punisher of
the wicked; who has obtained his wish, with the wise:
who is enviable, and is devoted to the god Harihara.

19. "The tree of virtue thrives by water poured with his donations;[4] while he shines with the splendid glory of sixteen kinds of gift.[5]

20. "In the year 1317;[6] and, of the cycle, Dháta; in
the month of Mágha, and light fortnight; on the day of
21. full moon; under the asterism sacred to the Pitris (Maghá);
on Sunday; upon the bank of the river Tungabhadrá,
22. which is adorned by the mountain Hemakúṭa; in the pre-
33. sence of the auspicious deity, Virúpáksha;[7] the valiant
Harihara,[8] revered among [260] mortals, liberal in his
34. gifts of land, and especially attentive to venerable priests,
22. has graciously given, with gold and with a libation of water,
23. to the auspicious descendant of Bháradwája and follower
of the Ṛigveda, the wise Vishṇudíkshita Paṭṭabardhí, son
24. of Váchaspati surnamed Bhila; and to the learned

therefore changed, in the translation, to others more generally known. Ramá is probably intended for Rádhá as a representative of Lakshmí.

In the original, Saraswatí is called Váṇí; but the fac-simile of the other inscription exhibits Sávitrí. S'achí is, in the original, erroneously written S'achi; and *jáma* occurs at the beginning of the verse for *náma*.

[1] Tilottamá is the name of a nymph celebrated for her beauty.

[2] Anasúyá is wife of Atri, and distinguished for conjugal affection. The name signifies unenvious.

[3] The princess is here termed Gaurí, which is a title of Párvatí; and which conveys an allusion to her own name Gaurámbiká.

[4] Solemn donations are ratified by pouring water into the hand of the donee.

[5] Sixteen meritorious gifts are enumerated in treatises on donation.

[6] Corresponding to A.D. 1395.

[7] A title of S'iva.

[8] The difference of idiom makes it necessary to transpose, in the translation, some of the verses of the original.

Anantadíkshita son of Rámabhaṭṭa, a descendant of
25. Vasishṭha and follower of Ápastamba's Yajurveda, inhabi-
28. tant of Ruchangi (a place known to have been visited by
the Páṇḍavas), the fertile and all-productive village of
25. Mádenahalli, also named Hariharapura, situated in the
26. midst of Bhilichedra, east of the village called Arísíker,
27. south of Gandikehalli, west of Pallavakaṭá, and north
29. of Bhúdihalli, a place to be honoured by all; marked on
the four sides by distinct boundaries; together with its
treasures, and hidden deposits, its stones, and everything
30. which it does or may contain; abounding with objects
pleasing to the eye; fit to be enjoyed by two persons;
graced with elegant trees; furnished with wells, cisterns,
ponds and banks; to be successively possessed by the
31. sons, grandsons and other descendants [of the grantees], as
long as the sun and moon endure, subject to be mortgaged,
32. sold, or any way disposed of; a village visited by assiduous
and gentle priests and attendants, and by various wise
persons, who are conversant with holy rites, and surpass in
voice melodious birds." [1]

[261] A particular description of the bounds of the village, and its land-marks, is next inserted in the Kánara language. After which the patent proceeds thus:

"This patent is of the king Harihara, the sole unalterable tree of beneficence, magnanimous, and whose sweet strains compose this royal grant. By his command this patent has been framed, expressed in due form, in the sacred tongue.[2]

"The boundaries of the village on all sides have been stated in the provincial dialect.

[1] Some parts of this long passage are obscure and doubtful. The last stanza, with two preceding, omitting one, (that is, the 29th, 30th, and 32nd) appears to be the same with three which occur in the grant preserved at Konjeveram, *viz.* 43rd, 44th, and 45th. (As. Res., vol. iii. p. 51.) But there are some variations between the reading of them in this inscription, and in the copy of the Konjeveram plates, from which Sir W. Jones made his version of that grant: and, in a few instances, the interpretation which I have adopted differs from his.

[2] This passage may indicate the artist's name, Váṇideva.

"Of original gift or confirmation of it, confirmation is superior to gift; by generous grants a man obtains heaven; by confirmation of them, an unperishable abode; for the confirmation of another's donation is twice as meritorious as a gift made by himself; and his own munificence is rendered fruitless by resumption of another's grants. He who resumes land, whether bestowed by himself or by another, is born an insect in ordure for sixty thousand years. In this world is one only sister of all kings, namely land, which has been conferred on priests:[1] she must not be enjoyed nor espoused.[2] This general maxim of duty for kings, should be strictly observed by you in all times; so Rámachandra earnestly conjures all future sovereigns.[3]

[262] "Śrí Virúpáksha; or the auspicious deity with uneven eyes."[4]

श्रीगणाधिपतये नमः ॥

नमस्तुङ्गशिरश्चुम्बिचन्द्रचामरचारवे ।
त्रैलोक्यनगरारम्भमूलस्तम्भाय शम्भवे ॥ १ ॥
अव्याद्व्याहतैश्वर्यकारणं वारणाननः ।
परदन्तीन्द्रतिमिरमिहिरो हरनन्दनः ॥ २ ॥
श्रीमानादिवराहो यः श्रियं दिशतु भूयसीं ।
गाढमालिङ्गिता येन मेदिनी यत्र मोदते ॥ ३ ॥
अस्ति कौस्तुभकल्पद्रुकामधेनुसहोदरः ।
रमानुजः सुधानाथः क्षीरसागरसम्भवः ॥ ४ ॥

[1] The terms may signify "fully granted away, or properly bestowed."

[2] In mythology, as well as in figurative language, the earth is wife of the sovereign. With an allusion to this idea, land, which has been granted away, is here called the king's sister: and his seizure of such land is pronounced incestuous.

The expression which has been translated 'espoused' (*karagráhyá*, literally, 'to be taken by the hand'), will also signify 'subjected to taxation:' for *kara* signifies 'tax' as well as 'hand.'

[3] This appears to be a quotation from some poem (a Puráṇa or Rámáyaṇa). The whole of the concluding part of the inscription (comprised in five stanzas) seems to be the same with the close of the grant on plates of copper preserved at Konjeveram. See As. Res., vol. iii. p. 53.

[4] This signature is in Kánara letters.

उदभूदन्वये तस्य यदुर्नाम महीपतिः ।
पालितं यत्कुलीनेन वासुदेवेन भूतलं ॥ ५ ॥
अभूदस्य कुले श्रीमान्भूमौ गुणगुणोदयः ।
अपास्तदुरितासङ्गः[1] सङ्गमो नाम भूपतिः ॥ ६ ॥
आसन्हरिहरः कम्पो बुक्करायमहीपतिः ।
मारपो मुद्दपश्चेति कुमारास्तस्य भूपतेः ॥ ७ ॥
पञ्चानां वृत्तगानानां प्रख्यातो बुक्कभूपतिः ।
[263] प्रसिद्धविक्रमो मध्यः पाण्डवानामिवार्ज्जुनः ॥ ८ ॥
दिक्करीन्द्रधुराधारादधिकस्कन्धबन्धुरः ।
बुक्करायस्ततः श्रीमानासीदाहवकर्कशः ॥ ९ ॥
यस्योद्यत्तुरङ्गे वितरति परितस्ताण्डवं मण्डलाग्रे
वक्त्रे शुष्कासुरभ्या भयभरभरितः कोङ्कणः शङ्कितायुः ।
सान्ध्रा रन्ध्राणि यावद्व्रजमनुततया गुर्ज्जरा जर्ज्जराङ्गाः
काम्बोजाः छिन्नधैर्याः सपदि समभवन्नाप्तभङ्गाः कलिङ्गाः ॥ १० ॥
राजाधिराजस्तेजस्वी यो राजपरमेश्वरः ।
भाषातिरिक्तभूपालभुजङ्गमविहंगराट् ॥ ११ ॥
राजवेश्याभुजङ्गो यः परराजभयङ्करः ।
हिन्दुरायसुरत्राणः शास्त्रैत्यादिभिरन्वितः ॥ १२ ॥
श्रीविद्यानगरी विश्वविजयोदयशालिनी ।
राज्ञा विजयिना येन राजधानी कृता स्थिरा ॥ १३ ॥
तस्य गौराम्बिका नाम महिषी समजायत ।
माननीयगुणा मायावल्लभस्य यथा रमा ॥ १४ ॥
कपर्द्दिनो यथा गौरी शचीव नमुचिद्विषः ।
पितामहस्य सावित्री छायेव द्युमणेरिव ॥ १५ ॥
विद्याप्रविभ्रमोल्लासतिरस्कृततिलोत्तमा ।
[264] अनसूयापि सासूया यत्पातिव्रत्यसम्पदा ॥ १६ ॥
अहीनभोगसम्पत्तिरसौ राजशिखामणिः ।
तस्यां हरिहरक्षौर्ध्वां कुमारमुदपादयत् ॥ १७ ॥

[1] [I have added a visarga after *-âsanga.*]

शिष्टान्संरक्षिता यस्तु दुष्टानामपि शासकः ।
लब्धाप्तो विदुषा सार्धं श्लाघ्यो हरिहरे परः ॥ १८ ॥
यस्मिन्षोडशमहादानानि[1] यशसा परिशोभिते ।
दानाम्बुधारया यस्य वर्धते धर्मपादपः ॥ १९ ॥
ऋषिभूवह्निचन्द्रे तु गणिते धातवत्सरे ।
माघमासे शुक्लपक्षे पौर्णमास्यां महातिथौ ॥ २० ॥
मघर्क्षे पितृदैवत्ये भानुवारेण संयुते ।
तुङ्गभद्रानदीतीरे हेमकूटोपशोभिते ॥ २१ ॥
श्रीविरूपाक्षदेवस्य सन्निधौ शुभदायिने ।
भारद्वाजसङ्कगोत्रायवचोयेसराय च[2] ॥ २२ ॥
वाचस्पतेर्भिक्षाख्यस्य सूनवे सूनतोक्तये[3] ।
षड्वर्धनिने विष्णुदीक्षितेन्द्राय धीमते ॥ २३ ॥
वसिष्ठगोत्रजायापस्तम्बशाखानुयायिने ।
रामभट्टसुतानन्तदीक्षिताय विपश्चिते ॥ २४ ॥
प्रसिद्धपाण्ड्यग्रामान्तर्पश्चिमस्थलवासिने ।
भिक्षिचन्द्राभिधासीमामध्ये ख्यातं महोदयं ॥ २५ ॥
पूर्वभागे स्थितं ग्रामाद्दरिसीकेरसंज्ञकात् ।
[265] गडिकेहल्लाभिधाद्ग्रामाद्दक्षिणां दिशमाश्रितं ॥ २६ ॥
ग्रामात्पञ्चवटाख्यात्प्रतीच्याभिमुखाश्रितं ।
ग्रामाच्च भूदिहल्याख्यादुत्तरस्यां दिशि श्रितं ॥ २७ ॥
प्रतिनाम्ना समाख्यातं पुरं हरिहराभिधं ।
मादेनहल्लीतिग्रामं सर्वसस्यसमन्वितं ॥ २८ ॥
सर्वमान्यं चतुःसीमासंयुतं च समन्ततः ।
निधिनिःक्षेपपाषाणसिद्धसाध्यसमन्वितं ॥ २९ ॥

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1 [षोडशमहादानानां ?]

2 [This line is so printed in the *Asiatic Researches*, and in the London edition of the Essays. It should be

भारद्वाजसगोत्राय बङ्कचो॰ येसराय च ।]

3 [सूनृतोक्तये ?]

अविद्यामामिवंयुतं द्विभोग्यं रम्यभूयुतं ।
वापीकूपतडागैश्च कच्छेनापि समन्वितं ॥ ३० ॥
पुष्करीयादिभिर्भोग्यं क्रमादाचन्द्रतारकं ।
सर्वस्वाधमनस्यापि विक्रयस्यापि चोचितं ॥ ३१ ॥
परीतं प्रयतैः स्निग्धैः पुरोहितपुरोगमैः ।
विविधैर्विबुधैः श्रौतोपचितैरपि कीर्तितैः ॥ ३२ ॥
वीरो हरिहरक्ष्माभृन्मान्नीयो मनस्विनां ।
भूदानपावभूतात्मा भूसुरात्मा विशेषतः ॥ ३३ ॥
स हिरण्यपयोधारापूर्वकन्दत्तवान्मुदा ।
———————————— ॥

इदमखिलराजशासनमधुरराकाकारगीतम-
हात्मनः[1] ॥ राज्ञो हरिहरनृपतेः शासनमनघैक-
पारिजातस्य ॥

[266] तस्य तच्छासनेनैव शासनं तु विनिर्मितं ।
शासनाचार्यधर्मैण वाचिद्देवेन शिक्षितं ॥
अस्मिन्ग्रामे चष्टदिक्षु सीमा देशभाषया लिखिता ॥
दानपालनयोर्मध्ये दानाच्छ्रेयो-नुपालनं ।
दानात्स्वर्गमवाप्नोति पालनादच्युतम्पदं ॥
स्वदत्ताद्विगुणं पुण्यम्परदत्तानुपालनं ।
परदत्तापहारेण स्वदत्तं निःफलं भवेत् ॥
स्वदत्ताम्परदत्तां वा यो हरेत वसुन्धरां ।
षष्टिवर्षसहस्राणि विष्ठायां जायते क्रिमिः ॥
एकैव भगिनी लोके सर्वेषामेव भूभुजां ।
न भोज्या न करग्राह्या विप्रदत्ता वसुन्धरा ॥
सामान्यो-यं धर्मसेतुर्नृपाणां
काले काले पालनीयो भवद्भिः ।
सर्वानेतान्भाविनः पार्थिवेन्द्रान्
भूयो भूयो याचते रामचन्द्रः ॥

[1] [This should be the first line of an Áryá śloka :
इदमखिलराजशासनमधुरकाकारगीतमहात्मनः ।]

IV. *Another and similar Inscription found at the same place.*

With a fac-simile of the foregoing inscription, Major Mackenzie communicated the copy of another inscription found also at Chitradurg and in the same year. The whole of the introductory part, containing the name of the prince, and his genealogy, is word for word the same in both grants: excepting a few places, where the variations are [267] evidently owing to mistakes of the artist, by whom the plates were engraved. I have consequently derived much assistance from this fac-simile in deciphering the original inscription before described.

The grant, here noticed, is by the same prince, and dated in Śaka 1213; only four years anterior to the one before translated. I think it therefore unnecessary to complete the deciphering of it, or to insert a copy or translation merely for the name and description of the lands granted, or the designations of the persons on whom they were bestowed.

Concerning the similarity of the grants, it may be remarked, that this circumstance is not a sufficient ground of distrust; for it cannot be thought extraordinary, that a set form of introduction to patents should have been in use; or that grants, made within the space of four years, by the same person, should be alike. I must acknowledge, however, that the inaccuracies of the original have impressed me with some doubt of the genuineness of the preceding grant. I do not, however, suspect it to be a modern forgery: but I apprehend, that it may have been fabricated while the upper Karṇâṭaka continued under the sole domination of Hindu princes. Still it may not be without its use, as an historical monument: since it may be fairly presumed, that the introductory part is copied from a more ancient monument; perhaps from that with which it has been now collated.

V. *Inscription on a stone found at Kurugode in the district of Adoni.*[1]

Another ancient monument, for the communication of which the Asiatic Society is indebted to the same gentleman, whose zeal for literary research, and indefatigable [268] industry in the prosecution of inquiries, cannot be too much praised, was found by him in the upper Karṇáṭaka in 1801, and has been presented to the Asiatic Society, with the following account of its discovery and of the inscription which it contains.

'The accompanying stone was found at Kurugode, fourteen miles north of Ballári, not far from the Tungabhadrá, among the ruins of the ancient town at the foot of the Durg; and was removed thence, in March, 1801, with the consent of the principal inhabitants, under the impression, that this specimen of ancient characters, with which it is covered, would be a desirable acquisition to gentlemen who cultivate the study of Hindu literature.

'The inscription is chiefly written in the ancient Kánara language much mixed with Sanskrit, of which some of the *ślokas* or stanzas are exclusively composed. It commences with the invocation of Śambhu (Śiva), and after introducing the grant, date, and description of the lands, concludes with several *ślokas* usually added as a formula in confirmation of such donations.

'A few of the stanzas, said to be written in the Prákrit language, could not be understood by the Śástrís and Paṇḍits at Triplikane, who explained the greatest part of the inscription to my Bráhmans: by their united efforts and knowledge, the accompanying translation was given, in which I have every confidence after the experience I have had of the fidelity of other translations by the same hands (some of which are already communicated).

'The inscription is useful as an historical record, if the Rájá Rakshámalla, mentioned here, be the same with the

[1] A'davani.

sovereign of the same name, mentioned in a history of Mysore, who flourished about the eighth century; thus agreeing in date nearly with the monument.

'The beauty of the character was also a strong motive [269] for removing it, as an appropriate offering to a Society, whose labours have been so successfully employed in illustrating the interesting remains of Hindu antiquity; and a permanent specimen of a character which appears hitherto to have escaped much notice.

'The common Kánara language and character are used by the natives of all those countries extending from Koimbatore,[1] north to Balkee,[2] near Bíder, and within the parallels from the eastern Gháṭs to the western, comprehending the modern provinces of Mysore,[3] Sera,[4] upper Bednore,[5] Soonda,[6] Goa, Adoni, Rachore,[7] Kanoul,[8] the Dúáb of the Kishṇá and Tungabhadrá, and a considerable part of the modern *Subahs* of Bíder and Bíjápur, as far as the source of the Kishṇá at least. Its limits and point of junction with the Mahraṭṭas may be yet ascertained with more precision; but in 1797, I had the opportunity of observing, that the junction of the three languages, Telinga, Mahraṭṭa, and Kánara, took place somewhere about Bíder.

'Besides the common character and language, another appears to have been used, denominated at present the Halla or ancient Kánara, in which this inscription is written: it has gone so much into disuse, that it was with some difficulty I could get people to read it. An alphabet will be yet communicated; as several books and ancient inscriptions are written in this character: and the remaining literature of the Jains in Bálághát, appearing to be preserved in it, affords additional motives for pointing it out to the attention of the learned, as probably affording means of extending the field of knowledge of Hindu literature.

[1] Koyamutúr. [2] Phálakí. [3] Mahisúr. [4] Sírá.
[5] Bednúr. [6] Sundá. [7] Ráchúr. [8] Kandanúr.

'Some of the inscriptions, at Kánara and Salset, appear [270] to be written in this character; and many monuments of the kind, dispersed over the upper Carnatic, hold out the prospect of further information.

'Among several manuscripts in Kánara, five, relating to the Jain religion and customs, are in my possession.

'The name of Kavelly Boria, a Bráhman, who was highly instrumental in forwarding and facilitating the investigations carried on in Mysore and the Nizám's dominions, is inscribed on the edge of this stone, as a small tribute to the zeal and fidelity of a native who evinced a genius superior to the common prejudices of the natives. He first suggested the idea of removing the stone to some place where it could be useful to European literature; and, by his conciliatory manner, obtained the concurrence and assistance of the natives for that purpose.'

The stone, sent by Major Mackenzie, with the foregoing account of the discovery of it, is nearly five feet high, and three wide, and about ten inches thick. The front is covered with writing in large characters, above which is a representation of the *linga* in the form usual in temples: it is surmounted by a sun and crescent; and near it stands a bull, intended perhaps for the bull called Nandi,[1] a constant attendant of Śiva: this is followed by the figure of a smaller animal, of similar form. The back of the stone is half covered with writing.

The translation, mentioned by Major Mackenzie, is here subjoined. Not being acquainted with the character in which the original is written, I have not collated the version; and have therefore used no freedom with it, except that of substituting, in many places, English words for Sanskrit, which the translator had preserved.

[1] [S'iva rides upon a bull, but Nandin or Nandi is one of his principal attendants. They are plainly distinguished in *Kumára-sambhava*, vii. 37.]

[271] TRANSLATION.

"Adoration be to the auspicious Swayambhú-nátha, or Self-existent Protector.

1. "I prostrate myself before Śambhu: whose glorious head is adorned with the resplendent moon; and who is the chief prop of the foundation of the three worlds.[1]

2. "May Swayambhú be propitious: he, who won immortal renown; who grants the wishes of those that earnestly intreat him; who pervades the universe; the Sovereign Lord of Deities; who destroyed the state and arrogance of the demons; who enjoyed the delightful embraces of Párvatí, to whom the learned prostrate themselves: the God above all gods.

3. "I prostrate myself before Śambhu; whose unquenchable blaze consumed the magnificent Tripura; whose food is the nectar dropping from the beams of the moon; who rejoiced in the sacrifice of heads by the Lord of Rákshasas;[2] whose face is adorned with smiles, when he enjoys the embraces of Gaurí."

(The foregoing stanzas are Sanskrit: the fourth, which is Prákrit, is unexplained. Those which follow are in Kánara.)

5. "By the consort of Deví, whose divinity is adored, the spouse of Párvatí, resplendent with the glorious light of gems reflected from the crowns of the Lords of Gods and demons whose heads lay prostrate at his feet; with a face ever lighted up with smiles; he is the self-existent deity: may the wealth, and the stations of his saints, be ever granted to us.

[272] 6. "The beams of whose sight, like the frequent waving of the lotus flower, flash reflected from the numerous crowns of glorious kings, of the chief of Gods, of the King of Kings, and of the Lord of Demons; who exists in all things,

[1] This is the same stanza, which begins the two inscriptions found at Chitradurg, and which likewise occurs in a grant in the possession of a Bráhman at Nandigul; and in that preserved at Konjeveram.

[2] Rávaṇa.

in all elements, in water, air, earth, ether, and fire, in the sun and moon: the renowned deity manifested in eight forms; Śambhu; may he grant our ardent prayers.

7. "Cheerfully I bow to Śambhu in the lotus of the heart; to him who increases and gives life to all; who holds supreme command over all; who, through his three divine attributes, created and animated fourteen worlds; who ever resides in the minds of his saints."

(The two next stanzas have not been explained. The following is in Halla Kánara.)

10. "For ever be propitious to Someśwara Devadi, son of the fortunate Bhuvana-malla-víra, the protector of the world, the chief sovereign of kings, the pre-eminent monarch, a man of superior virtue, a distinguished personage of the noble race, the ornament of the Chaluka tribe, whose state be increased progressively in this world, so long as the sun and moon endure; who reigns in the city of Kalyán, enjoying every happiness and good fortune, with the converse of good men and every other pleasure. In this country of Kuntaladeśa,[1] a land renowned for beauty and for manly strength over all the sea-girt earth, is situated Kondavipattan, placed as the beauty spot on the human face; a city favoured by the goddess of prosperity; as a nosegay of elegant flowers adorning the tresses of the beauteous goddess of the earth.

11. "How is this favoured land? In its towns are nume-[273]rous groves of mango; plantations of luxuriant betel and fields of rice: in every town are channels of water, and wells, opulent men and beautiful women; in every town are temples of the Gods and of the saints: in every town are men blessed with vigour and every virtue.

12. "In its centre, is the mighty hill of Kurugode-durg, like the fastnesses[2] of heaven, ever famed, rearing aloft its top

[1] Kuntala-deśa, the ancient name of the province in which Kurugode is situated; part of the Ballári or Adoni District. (Note by Major Mackenzie.)

[2] The poet indulges his fancy in describing this favoured *durg;* but, in fact, it

crowned with fortresses; in height and compass surpassing all the strong hills on the right or left.

13. "This Kurugode was established as the capital of his dominions by the King of Kuntala, who was the foe of the King of Chola;[1] who terrified the Gurjara; who is the instrument to destroy the plants of Madru; who put Páṇḍya to flight. Is it possible for the king of snakes, though possessed of a thousand tongues, to praise sufficiently the beauty of this city?

14. "What is the description of the delightful gardens that encompass the city? They are gardens wherein are found the *tilak*, the *tamál*, the palm, the plantain, the Mimusops, the trumpet-flower, the tremulous fig-tree, the citron, the Oleander, Mesua, and Cassia, the cotton-tree, the Carambola and Pœderia, the mango, Butea, and fragrant Naliká; and various trees, that flourish and produce through all seasons as in the garden Nandana: these surrounded this city of Kurugode."

(The fifteenth stanza is unexplained.)

16. "In the city of Kurugode, the residence of the god-[274]dess of prosperity, where are numerous temples of worship, fertile lands, happy spouses, friendly intercourse, a favourable government, every sacred decoration and zealous devotion in the service of Śiva;

17. "The Lord of that city, a warrior unrivalled, whose name was Rakshámalla, whose breast is tinged with the saffron communicated from the bosom of beauty, whose renown is ever praised over the whole world."

(The eighteenth stanza is in Prákrit, and not explained.)

19. "This Rájá Rakshámalla, prince of the earth, born of

is only about 250 feet high, and no ways remarkable for strength. (Note by Major Mackenzie.)

[1] Chola-deśa, ... The modern Tanjore country.
Gurjara, ... Guzarat.
Madru, ... Madura and Trichinopoly.
Páṇḍya, ... Marawar and Tinevelly. M.

so renowned a race of sovereigns, was happily possessed of valour, of victory, and of wealth.

20. "For the King Rakshámalla, who was lord of riches and a devout worshipper of Śiva, had for his consort Somaldeví, and begot a son named Nerungala Rájá, husband to the goddess of renown, the bestower of wealth on the distressed, on the learned, and on the unfortunate, to the utmost extent of their wishes.

21. "To Nerungala Rájá and to his wife Pakshalá-deví (the source of all virtues), were happily born two sons, named Imádi Rakshámalla and Somabhúpála, whose renown, like the sky, overspread the whole earth.

22. "What is the description of the eldest of these princes? Imádi (or the second) Rakshámalla Rájá, the successor of the former, seated on the excellent throne, attended by many mighty elephants, in colour like the Chamarí,[1] ruled the whole kingdom under one umbrella, possessing the wonderful power, like Chinna-govinda, of feeding tigers and sheep in the same fold.

23. "The King Rakshámalla acquired great power: his mighty splendour and good fortune were such as drew [275] the applause of the whole admiring world. The globe was filled with the light of his reputation. The beauty of his person is worthy of the praise even of Cupid, the God famed for beauty. He was the destroyer of sin; eminent above foreign kings, and in battle he was as Vishṇu.

24. "May Mṛitu[2] [Śiva] graciously bestow eternal wealth and prosperity of empire, on the King Rakshámalla, among all his chief saints.

"During the gradual increase of the empire of Rakshámalla extending from the north, all around, even to the north, his servant and worshipper, a descendant of Kaśyapa's race, manager of the affairs of Talgará-amarí, invested with full authority; equal in knowledge to Yugandhar, the sun to

[1] *Bos grunniens.* [2] [*Mṛityu?*]

enlighten the cast of Vajínasa, [as the sun enlightens the sky]; chief of ministers, born by the blessing of the god Swayambhú, the source of wealth, was Bábarájú."

(Several lines follow giving an account of the ancestors of Bábarájú, which have not been translated.)

"Such is Bábarájú, who built a temple to the god Swayambhú-deví, while he was managing the affairs of his sovereign lord, the mighty king, the great Rakshámalla, whose god was the self-existent deity.

"The praise of the priests of the temple.

"They were learned in the sacred ceremonies of holy devotion, in self-restraint, in austere fast, appropriate studies, alms, remembrance, silence, religious practice, and the worship of Śiva.

"They were devout in performing the ceremonies of the worship of the gods of the family. Among them was one named Bálaśiva-áchárya, unequalled for a good or happy genius. To this famous Bálaśiva-áchárya was granted this gift with water poured into his hands.

[276] "The charitable donation of lands given to the god Swayambhú in the year of Śáliváhan 1095,[1] in the Vijaya year of the cycle, and on the 30th of the month Márgaśira, on Monday, in the time of an eclipse of the sun."

(It appears unnecessary to insert the description of the lands.)

"Also Chinna-govinda-sítara-gundi, king of the city of Bhogavatí, equal to the sovereign of Bhaṭṭál, who was acknowledged for ever by the excellent Virakálídeva, the mighty king of the earth named Imádi Rakshámalla-deva. In the year of Śáliváhan 1103,[2] of the cycle Plava, and on the 15th of Kártika, on Monday, in the gracious time of the moon's eclipse, at the time when he made over in alms Tripura Agraharam, granted under Dárápúrbak to Bálaśiva-deva, who repaired all the buildings of the temples of Swayambhú-deva.

[1] Answering to A.D. 1173.
[2] Corresponding to A.D. 1181.

who is distinguished for knowledge of the pure Vedas, and of other religious institutions and customs of the worshippers of Śiva, and for charity in feeding the poor."

(The sequel of the inscription is likewise omitted: it relates to a further grant made by the widow of Bábarájú, at the time of her burning herself with the corpse of her husband. The concluding part of it was left untranslated, being stated to be illegible.)

The eclipses, mentioned in these grants, do not appear reconcilable with their dates. According to the table of eclipses calculated by Pingre,[1] the solar eclipses, which occurred in 1172 and 1173, fell on 27th January and 23rd June, 1172, and 12th June, 1173; and the lunar eclipses [277] in 1180 and 1181, were on the 13th February and 7th August, 1180, and 22nd December, 1181. None of these approach to the dates of Márgaśira or Agraháyaṇa 1095 and Kártika 1103. Unless, then, the era of Śáliváhana have been counted differently in the peninsula of India, from the mode in which it is now reckoned, and on which the comparison of it with the Christian era is grounded, it seems difficult to account for this disagreement of the dates and eclipses in any other way, than by impeaching the inscription, the authenticity of which there is not otherwise any reason to question.

VI. *Inscription on a Stone found at Kurrah.*

Having learnt from Captain C. Stewart (a Member of this Society), that an inscription had been remarked by him in the gateway of the fort of Kurrah (Khará), I obtained, through the assistance of Major Lennon, then stationed in the vicinity of that place, the stone itself which contains the inscription. It now belongs to the Asiatic Society.

The inscription is very short; contains the date 1093 Samvat, the name of the prince, as also names of several

[1] Published in *L'art de vérifier les dates;* and inserted in Playfair's *System of Chronology.*

places; and is written in a very legible character: yet all my endeavours to arrive at any explanation of it have been unsuccessful. Whether it be only a fragment of an inscription (for the stone is very narrow),[1] or the inscription have been inaccurately engraved (and this also is countenanced by its appearance), I shall not take upon myself to determine. At present, I can only translate the first six, out of sixteen lines, which run thus: "Samvat 1093,[2] [278] on the first day of the light fortnight of Áshádha. This day, at this auspicious Kaṭa, the great and eminent prince Yaśaḥpála,[3] in the realm of Kauśámba, and village of Payahása, commands, that ————."[4]

संवत् १०९३
आषाढशुदि १
अद्येहश्रीमत्कटे
महाराजाधिराज
श्रीयशःपालःकौ
शाम्बमण्डलेपयहा
सग्रामेमहत्तम
गुसमादिशतियथा
यक्षेसेकीयमातु
रविकच्छग्रासन
स्वंप्रसादिष्टात्वमन्व
स्वग्रक्षेहाकारहिर
ण्यप्रत्वादायादिकं
मस्तोपनेतव्यमिति
इग्रयन्वेनसहपिकं
ठावंकत————
कुरापोषा————
————————

[1] Its height is four feet nine inches, but it is only nine inches wide.

[2] Corresponding to A.D. 1037.

[3] It may be worth remarking, that the inscription discovered at Sáranátha, near Benares, dated ten years antecedent to this, relates to a family of princes whose names had a similar termination. As. Res., vol. v. p. 133.

[4] [The inscription has been recompared by Prinsep, *B. A. S. Journ.* 1836, p. 731, and he has given several corrections, but he adds that "still with these emendations the context hardly bears complete translation, though the general object is clear."]

[279] VII. *Inscription on a Plate of Copper found in the District of Dinájpur.*

In the beginning of the present year (1806), a plate of copper was found at Ámgáchhi in Sultánpur, by a peasant, digging earth for the repair of a road near his cottage. He delivered it to the nearest police officer, by whom it was conveyed to the magistrate, Mr. J. Pattle: and by him forwarded for communication to the Asiatic Society. Ámgáchhi, though now a small village, is described as exhibiting the appearance of having formerly been a considerable place. Remains of old masonry are found there; and numerous ponds are remarked in the vicinity of that and of the adjacent villages. It is situated at the distance of about fourteen miles from Budál; where an ancient pillar stands, of which a description (as well as the inscription, which is read on it), was published in the first volume of *Asiatic Researches* (p. 131).

The plate is very large, being fourteen inches high and thirteen broad. It is surmounted by a highly wrought ornament of brass, fixed on the upper part, and advanced some distance on the plate so as to occasion a considerable break in the upper lines. The superior surface is covered with writing in very close lines and crowded characters. The inscription is completed on the inferior surface, which contains sixteen lines (the upper surface having no less than thirty-three). The character is ancient Devanágarí, and the language Sanskrit: but so great a part of the inscription is obliterated (some portion of every line being illegible), that it is difficult to discover the purport of the inscription. After wasting much time in endeavouring to decipher the whole of it, I have been able only to ascertain the name of the grantor, and a part of his genealogy; with the date [280] of the grant, which unfortunately is reckoned only by the reign, without any reference to a known era.

The ornament affixed to the plate, and representing a seal,

contains a single line of writing, which is distinctly read, Śrí Vigrahapála-deva. This name, as of the grantor, is found at the close of the inscription; and it occurs more than once in the body of the patent. Among his ancestors and predecessors, the following names are distinctly legible.

The first prince mentioned is Lokapála, and after him Dharmapála. The next name has not been deciphered: but the following one is Jayapála, succeeded by Devapála. Two or three subsequent names are yet undeciphered:[1] they are followed by Rájapála,——páladeva, Vigrahapála-deva, and subsequently Mahípála-deva, Nayapála and again Vigrahapála-deva.

So far as a glimpse has been yet obtained of the purport of the inscription, it seems to be a grant by Vigrahapála-deva, in the making of which Nayapála likewise appears to have had some share. It is dated Samvat[2] 12, on the 9th day of Chaitra.

The use of the word Samvat (which properly signifies a year) to denote the year of the king's reign, and not that of Vikramáditya's era, merits particular notice. In the inscription on the plates found at Mongír,[3] containing a grant of land by a prince who appears to be of the same family, the date was read by Mr. Wilkins, Samvat 33; which was supposed both by him and by Sir W. Jones to intend the era of Vikramáditya.[4] I have always [281] entertained doubts of that interpretation: and, among other reasons for hesitating, one has been the improbability, which to my apprehension exists, that the era should have been in use, and denoted by the same abbreviated term, so early after the time at which it commences. Eras by which nations have continued to reckon for a series of ages, have not usually been introduced until a considerable time after the event from which they are counted: and, when first introduced, have been designated by some

[1] One seems to be Náráyaṇa; perhaps Náráyaṇapála.

[2] The original seems to exhibit Samat: but this must be intended for Sambat or Samvat.

[3] As. Res., vol. i. p. 123.

[4] Ibid. p. 130.

more definite term than one merely signifying a year. But the word *Samvat* (abbreviated from *Samvatsara* 'a year') being in that inscription prefixed to a low numeral, and not expressly restricted, as is usual where Vikramáditya's era is meant, was more likely to intend the year of the reigning king (though Sir W. Jones thought otherwise[1]) than that of a period reckoned from the birth, or the accession, or the demise of another monarch. It appeared to me likewise, as to Captain Wilford, on examining the fac-simile of the inscription in question,[2] that the character, which stands in the place of the *t* of Samvat, resembled more nearly the numeral 1. The date might therefore be 133 instead of 33. I inclined, however, to believe the lower number to have been rightly read by Mr. Wilkins on the original plate: and consequently supposed it to be the date of the reign of Devapála, the prince who made the grant. The date of the Ámgáchhi plate, which must be referred to the reign of the grantor Vigrahapála, seems strongly to corroborate this opinion.

The present inscription, though yet imperfectly deciphered, appears to be useful towards ascertaining the age [282] of the Mongír grant. The names of Dharmapála and Devapála occur in both inscriptions; as that of Rájapála does, on the pillar at Budál, as well as on the Ámgáchhi plate. Some of these names are also found in the list of princes enumerated in the Áyíni Akbarí[3] as having reigned in Bengal before Ballálasena. The authority of Abú'lfazl, on Hindu history, is indeed not great: but the inscription on the statue of Buddha, which was found at Sáranátha, near Benares,[4] proves, that a family of princes, whose names terminated in *pála*, did reign over Gauḍa in Bengal, near eight hundred years ago: and this is consistent with the period to which that dynasty is brought down by Abú'lfazl; namely, the middle of the eleventh cen-

[1] As. Res., vol. i. p. 142.
[2] Plates i. and ii. in the 1st vol. of As. Res.
[3] Vol. ii. p. 26. [4] As. Res., vol. v. p. 133.

tury of the Christian era. It appears also, from the same inscription found at Sáranátha, that these princes were worshippers of Buddha, a circumstance which agrees with the indications of that faith in the Mongír grant, as translated by Mr. Wilkins. The name of Mahípála, mentioned as king of Gauḍa in the Sáranátha inscription, occurs likewise in the Ámgáchhi plate; and if it be reasonable to believe, that the same person is intended in both instances, it will be right to infer, that the grant contained on the plate found at Ámgáchhi is nearly eight hundred years old; and that the plate found at Mongír is more ancient by two or three centuries. This reduces the age of the Mongír grant to the eighth or ninth century of the Christian era; which I cannot but think more probable, than the opinion of its being anterior to the birth of Christ.

[283] VIII. *Inscriptions on Plates of Copper at Nidigal and Goujda.*

To the foregoing description of several monuments, which have been presented to the Asiatic Society, I shall add a brief notice of two other inscriptions, of which copies have been received.

Mention has been already made of a grant of land, inscribed on five plates of copper, seen at Nidigal, in the year 1801. It was in the possession of a Bráhmaṇa residing at that place: and a copy of it was taken by Major Mackenzie, which has been communicated by him to the Society. The grant appears to be from the second Bukka-rájá, who was third in succession from the first prince of that name, and grandson of the king by whom the grants before mentioned were made. If the date have been correctly deciphered from the copy of this inscription, it is of the year 1331 Śaka, corresponding to A.D. 1409.

Another inscription, communicated by Major Mackenzie,

purports to be a grant by Janamejaya, the celebrated monarch who reigned in India at the commencement of the present age or Kaliyuga. It is in the hands of the Bráhmans or priests of Goujda Agraharam in Bednúr; and was, with some reluctance, entrusted by them to Major Mackenzie, who himself took from it a copy in fac-simile, the exactness of which is demonstrated by the facility with which the inscription may be deciphered from that copy. The original is described as contained in three plates of copper, fastened together by a ring, on which is the representation of a seal, bearing the figure of a boar with a sun and crescent. The purport of the inscription, for I think it needless to make a complete version of it, is that 'Janamejaya, son of Paríkshit, a monarch reigning at Hastinápura, made a progress to the south, and to other [284] quarters, for the purpose of reducing all countries under his domination; and performed a sacrifice for the destruction of serpents, in presence of the god (or idol) Haridra,[1] at the confluence of the rivers Tungabhadrá and Haridrá, at the time of a partial eclipse of the sun, which fell on a Sunday, in the month of Chaitra, when the sun was entering the northern hemisphere; the moon being in the Nakshatra Aświní.'[2]

Having completed the sacrifice, the king bestowed gold and lands on certain Bráhmaṇas of Gautamagráma: whose names and designations are stated at full length, with the description and limits of the lands granted. The inscription concludes with two verses; the same with two of those which occur in

[1] [*Harihara* in the As. Researches.]

[2] Such is the deduction from the text, which states a half eclipse of the sun in Chaitra, on the sun's entrance into the Uttaráyaṇa, or northern path, at the moment of Vyatipáta (which imports new moon on a Sunday in any one of the under-mentioned Nakshatras, *viz.* Aświní, S'ravaṇá, Dhanishṭhá, A'rdrá, Aśleshá, and Mṛigaśiras: the first of which is the only one compatible with the month). The words of the text are *Chaitramáse krishṇa* (should be *kṛishṇa*) *pakshe so* . . . . *karaṇa uttarâyaṇa san* . . . . *vyatipáta nimitte súrya parvaṇi ardha grása grihita* (should be *gṛihíta*) *samae* (should be *samaye*).
In the places marked with dots, the letters are wanting in the original.

the plates found at Chitradurg[1]; and in those preserved at Konjeveram.[2]

If reliance might be placed on this as an ancient and authentic monument, its importance, in the confirmation of a leading point of Indian history, would be obvious and great. Major Mackenzie, in communicating the copy of it, expresses a doubt of its authenticity; but remarks, that it can be no modern forgery, for the people them[285]selves cannot read the inscription. I concur with Major Mackenzie both in distrusting the genuineness of this monument; and in thinking that it is no recent fabrication.

Numerous and gross errors of grammar and orthography,[3] which can neither be explained by a gradual change of language, nor be referred to the mistakes of a transcriber or engraver, but are the evident fruit of ignorance in the person who first penned the inscription in Nágarí characters, would furnish reason for discrediting this monument, were it otherwise liable to no suspicion. But, when to this circumstance are added the improbability of the copper-plates having been preserved during several thousand years, and the distrust with which any ancient monument must be received, where its present possessor, or his ancestor, may have had claims under the grant recorded in it, there can be little hesitation in considering this grant of Janamejaya as unauthentic; independently of any argument deduced from the character, which is not perhaps sufficiently antique; or from the astronomical

[1] See pages [261] and [266] of this volume.

[2] As. Res., vol. iii. p. 52. The verses are those numbered 50 and 54.

[3] For example, *samae* for *samaye* (समए for समये), a palpable error, obviously arising from the blunder of an ignorant amanuensis writing from dictation. The mistake occurs more than once; and can be accounted for in no other manner: the syllables *e* and *ye* being alike in sound, though dissimilar in form; and the blunder being such as no person acquainted with the rudiments of the Sanskrit language could have committed. Other instances have been remarked, almost equally strong: as *Parikshiti* for *Parikshit*: *chakravrartti* for *chakravartti*. Short vowels for long, and *vice versâ*, in repeated instances; the dental for the palatal *s*; and numerous other errors of spelling; besides faults of grammar and style.

data in this inscription, which, however consistent with Indian notions of astronomy and chronology, will hardly bear the test of a critical examination.

[286] IX. *A Grant of Land by Jayachandra, Rájá of Kanoj.*

It may be proper to notice further, in this place, the inscription of which mention was made at the beginning of this essay, as having been deciphered by a Paṇḍit (Sarvoru Trivedí), who communicated to me a copy of it, with the information, that the original has been conveyed to England by the gentleman in whose possession it was seen by him. According to that copy, the genealogy of the prince, who made the grant recorded in the inscription, is as follows:

1. Śrípála,[1] a prince of the solar race.
2. His son Mahíchandra.
3. Śríchandra-deva, son of the last mentioned; acquired, by his own strength, the realm of Gádhipura or Kányakubja (Kanoj); visited Káśí and other holy places; and repeatedly gave away in alms his own weight in gold. He appears to have been the first King of Kanoj in this family.
4. Madanapála-deva, son and successor of Śríchandra.
5. Govinda-chandra, son of Madanapála.
6. Vijaya-chandra-deva (the same with Jaya-chand),[2] son of Govinda-chandra; is stated in the inscription as issuing his commands to all public officers, and to the inhabitants of Nágulí assembled at Devapallípaṭṭana, enjoining them to observe and obey his patent; which is recited as a grant of land to two Bráhmaṇas, conferred by him on the day of full moon in Mágha 1220,[3] subsequently to his inauguration as Yuva-

[1] [Rather Yaśovigraha.]

[2] [This is an error, see p. [294]. Jayachandra was the son of Vijayachandra. We have the authority of inscriptions for the following dates, in this list of kings; Madanapála, A.D. 1097; Govindachandra, 1120 and 1125; Vijayachandra, 1163; Jayachandra, 1177, 1179, and 1186. Jayachandra's grandson S'ivájí became the first Rája of Jodhpur. See Dr. Hall, B.A.S. Journ. 1858.]

[3] Corresponding to A.D. 1164.

rája or designated successor and associate in the empire. The inscription concludes by quoting, from a Puráṇa, four stanzas to [287] deprecate the resumption of the grant: and by a signature importing "this copper was engraved by Jayapála."

Without having seen the original, no opinion can be offered on the probable genuineness of this monument. But it will be observed, that the inscription is consistent with chronology; for Jaya-chand, who is described in the Áyíni Akbarí,[1] as supreme monarch of India, having the seat of his empire at Kanoj, is there mentioned as the ally of Shahábuddín in the war with Ṛithavíraja of Pithorá, about the year of the Hijra 588, or A.D. 1192: twenty-eight years after the date of this grant.

Remarks.

A few observations on the general subject under consideration will terminate this essay.

Most of the ancient monuments, which have been yet discovered, contain royal grants of land; framed, commonly, in exact conformity to the rules delivered by Hindu writers who have treated of this subject.[2] That durable memorials have been usually framed to record other events or circumstances, there is no reason to suppose; and this consideration is sufficient to explain the comparative frequency of monuments which recite royal grants. It was the interest, too, of persons holding possession under such grants, to be careful in the preservation of the evidence of their right. But this circumstance, while it accounts for the greater frequency of monuments of this description, suggests a reason for particular caution in admitting their genuineness. Grants may have been forged in support of an occupant's right, or of a claimant's pretensions. It will [288] be, therefore, proper to bring a considerable portion of distrust and jealousy to the examination of any inscription on stone or metal, alleged to be ancient,

[1] Gladwin's Translation, vol. ii. p. 119.

[2] As. Res., vol. iii. p. 50. Digest of Hindu Law, vol. ii. p. 278.

and now possessed by persons who have any claims or pretensions under the grant which it contains. But no such cause of jealousy exists, where the monument in question favours no one's pretensions, and especially where it is accidentally discovered after being long buried. It is, indeed, possible, that such a monument, though now casually found, may have been originally a forgery. But even where that may be suspected, the historical uses of a monument fabricated so much nearer to the times to which it assumes to belong, will not be entirely superseded. The necessity of rendering the forged grant credible would compel a fabricator to adhere to history, and conform to established notions: and the tradition which prevailed in his time, and by which he must be guided, would probably be so much nearer to the truth, as it was less remote from the period which it concerned.

In the present state of researches into Indian antiquities, the caution here suggested appears to be that which it is most requisite to observe. When a greater number of monuments shall have been examined and compared, more rules of criticism may be devised; and will, at the same time, become particularly requisite, should the practice arise of purchasing ancient monuments; or of giving rewards for the discovery of them. At present no temptation exists for modern fabrications, and little caution is therefore necessary to avoid imposition.

XI.

INSCRIPTIONS UPON ROCKS IN SOUTH BIHAR.[1]

[From the *Transactions* of the Royal Asiatic Society, vol. i. pp. 201—206.]

[289] Dr. Buchanan Hamilton, while engaged in statistical researches in the provinces subject to the government of Bengal, gave attention to the antiquities of the country, as to other scientific objects, which he had the opportunity of investigating. His reports, comprising the result of his inquiries, are deposited in the Library and Museum of the East-India Company; and, at his instance, the Court of Directors have sanctioned a liberal communication of the information contained in them to this Society. Among the antiquities collected by him, there are many fac-similes of inscriptions. I purpose submitting to the Society explanations of such among them as are interesting; and I now present the translation of one, which appears curious.

It is an inscription upon a rock, denominated, from an idol delineated on it, Táráchándí, in the vicinity of Sahasram, in South Bihár; and contains the protest of a chieftain, named Pratápa-dhavala-deva, bearing the title of Náyaka, and that of Rájá of Japila, against an usurpation of two villages by certain Bráhmaṇas in his neighbourhood, under colour of a grant, surreptitiously obtained through corruption of his officers, from the Rájá of Gádhinagara or Kányakubja (Kanoj), who was the celebrated Vijaya-chandra. Its date is 1229 Samvat, corresponding to A.D. 1173.

[1] Read at a public meeting of the Royal Asiatic Society, December 4, 1824.

[290] In Dr. Buchanan Hamilton's collection, there are copies of two other inscriptions upon rocks, in the neighbourhood, exhibiting the name of the same chieftain, in conjunction with many of his kindred in the one; and followed by a long series of his successors in the other. I observe little else interesting in them, besides the names and the dates.

The site of the principal inscription is thus described by Dr. Buchanan Hamilton. 'In a narrow passage, which separates the northern end of the hills from the great mass, and through which the road leads from Sahasram to Rautásghar, is a place where Tárácháńdí is worshipped. The image is carved on a ledge of rock; and is so small, and so besmeared with oil and red lead, that I am not sure of its form. It seems, however, to represent a woman sitting on a man's knee; but not in the form usual in Bihár, which is called Hara-gaurí. Adjacent to the image, a cavity in the rock has been enlarged by one or two pillars in front, supporting a roof, so as to form a shed, to which the priest, and a man who sells offerings and refreshments for votaries and passengers, daily repair. A few persons assemble in the month of Śrávan. But the chief profit arises from passengers; who are very numerous: and all who can afford, give something. The priest is a Sannyási. Above the shed, the Musulmáns have erected a small mosque, in order to show the triumph of the faith: but it is quite neglected. The image is usually attributed to the Cheros: and many small heaps between the place and Sahasram, are said to be ruins of buildings erected by the same people. But a long inscription, carved on the rock within the shed, refers to Vijaya-chandra, sovereign of Kanoj.'

That inscription was strangely misinterpreted by the Paṇḍita attached to the survey on which Dr. Buchanan [291] Hamilton was engaged. The Paṇḍita supposed the chieftain, Pratápa-dhavala, to premise an intention of commemorating his descendants; and to proceed to the mention of Vijaya-chandra, proprietor of Kanoj; and Śatrughna, son of the

Mahárája: whence Dr. Hamilton inferred, that Vijaya-chandra was son of Pratápa-dhavala. Dr. Hamilton observes, indeed, that others gave a totally different interpretation: considering it as 'an advertisement from Pratápa-dhavala, that he will not obey an order for giving up two villages, which, he alleges, had been procured by corruption from the officers of Vijaya-chandra, king of Kanoj.'

The Oriental scholar, upon inspection of the fac-simile, will have no difficulty in perceiving that the latter was the right interpretation; and it is therefore needless to pursue remarks which were built upon the Paṇḍita's grossly erroneous translation.

The style of the protest is singular; and on that account alone, I should have thought it very deserving of notice. It serves, however, at the same time to show, that the paramount dominion of Kányakubja extended to the mountains of South Bihár: and it presents an instance of the characteristic turbulence of Indian feudatories.

The second inscription, bearing the name of the same chieftain, Náyaka Pratápa-dhavala-deva, with the date 1219 (A.D. 1163), Saturday, 4th Jyaishṭha-badi, and underneath the name of his brother, the prince Tribhuvana-dhavala, the prince's wife Sulhi, and another female Somalí, and two sons Lakshmyáditya and Padmáditya; exhibits a rude figure of a goddess Totalá-deví, attributed to the family priest Viśwarúpa. On the other side of the figure are the names of five daughters, and, at the foot of it, six sons of the Náyaka. These are Varku, Śatrughna, Bírabala, Sahasa-dhavala, [292] Yámi-kártikeya and Śántayatna-deva. Beneath are names of Káyasthas, Yajnadhara, and Vidyádhara, sons of Kusumahára: the treasurer Devarája, and the door-keeper (*pratihára*) Tishala.

The site of this inscription is described by Dr. Buchanan Hamilton: 'Where the Tutrahi, a branch of the Kudura river, falls down the hills of Tilothu, is a holy place, sacred to

the goddess Totalá. The recess, into which this stream falls, is about half a mile deep; and terminates in a magnificent, abrupt rock, somewhat in the shape of a horse-shoe, and from 180 to 250 feet high. In the centre is a deep pool, at all times filled with water, and which receives the stream, that falls from a gap in this immense precipice. This gap may be thirty feet wide; and the perpendicular height there 180 feet.

'The image is said to have been placed by the Cheros, about eighteen centuries ago; and, in fact, resembles one of the images very common in the works attributed to that people in Bihár. But this antiquity is by no means confirmed by the inscription, the date of which is evidently in Samvat 1389, or A.D. 1332.

'In another inscription it is said, that the family priest of a neighbouring prince, Pratápa-dhavala, had, in A.D. 1158, made the image of the goddess: alluding evidently to a rude figure, carved on rock, and now totally neglected.

'The image now worshipped is, as usual, a slab carved in relief, and represents a female with many arms, killing a man springing from the neck of a buffalo.[1] It is placed on the highest ledge of the sloping part of the rock, immediately under the waterfall. From two to three hundred votaries, at different times in the month of Śrávan, go to the place, to pray.'

[293] The third inscription is upon a rock at Bandughâta, on the Sone river, opposite to Japila, which was the chieftain's principality. The date assigned to Mahá-nṛipati (*i.e.* Mahárája) Pratápa-dhavala, besides the number of twenty-one years (apparently the duration of his reign, as chief of Japila), is, in the fac-simile, written 2219 Samvat; but the first digit being clearly wrong, it must be corrected to 1219, or 1229: most likely the latter. No date is assigned to his predecessor Udaya-dhavala; nor to the line of his successors, beginning with Vikrama, who is perhaps the same with Varku (the first among his sons, named in the second inscription), and who

[1] It figures Mahishásura, vulg. Bhainsásur, slain by Bhavání.

appears from the epithet of *vijayin*, 'victorious,' to have been the reigning prince, when his name was here set down. The rest must have been subsequently, from time to time, added; and the first among them is Sahasa-dhavala, perhaps the fourth son of Pratápa-dhavala, mentioned in the second inscription.

Above all this, there have been inscribed, at a much later period, other names, viz. 'Mahárája Nyunat-raï or Nyunta-ráya, who went to heaven (*surapura,* i.e. the city of the gods) in the year 1643 Samvat;' and 'Mahárája Pratápa-ráya, or Pratápa-rudra, who went to heaven in the year 1653 Samvat.'

In another part of the inscription, there occurs the name of Mahárája Mánasinha, with the dates of 1652 and 1653 Samvat; and lower down, a string of three names, Mahárája Kansarája, Pratápa-dhavala-deva, and Madana-sinha. Between the two last, there is interposed the date of 1624 Samvat.

The name of Pratápa appears then to have been of frequent recurrence. The family, which yet possesses the principality of Bilonja, the representative of which, when visited by Dr. Hamilton, was Rájá Bhúpanátha-[294]sá, claims descent from Pratápa-dhavala, chief of Japila.

Japila is a large estate south of Rautás (Rohitáśwa), in the district of Rámaghar. But the territories of the ancient chieftain seem to have extended beyond its present limits, and to have reached the vicinity of Sahasram.

These inscriptions have no other chronological value, but as they corroborate the date of one possessing more historical interest, noticed in the Researches of the Asiatic Society of Bengal (vol. ix. p. 441).[1] It records a grant of land by the same Rájá of Kányakubja, Vijaya-chandra; and, as usual, recites the names of his ancestors, tracing his genealogy through no less than six generations. The original was said to have been transmitted to Great Britain by the late Sir

[1] See page [286] of the present volume.

John Murray M'Gregor; but I am unable to say where it has been deposited.[1] It would be an acceptable communication, as serving to authenticate the history of a prince among the most conspicuous in the annals of his country; on which he inflicted the same calamity which Count Julian did on Spain, by assisting a Musulmán conquest of it, in revenge for the [295] abduction of his daughter.[2] The analogy indeed is not quite complete; for it was *seduction* of a daughter which Count Julian sought to revenge.

Concerning the inscription at Táráchándí, of which a translation is here presented, it is to be remarked, that the denunciation or protest which it records, is first expressed in verse,[3] and is then repeated in prose. This repetition has much assisted the deciphering of it, and the correction of some errors, either of the original, or of the copy. A few explanatory notes will be found annexed.

Translation of the Inscription at Táráchándí.

"Pratápa-dhavala, wholly divine (*deva*), possessor of happily risen and celebrated glory, addresses his own race. In these villages, contiguous to Kalahaṇḍi,[4] that contemptible ill copper[5] [grant], which has been obtained by fraud and bribery,

[1] It appears from an inscription (a grant on plates of copper) published, with a translation, in the fifteenth volume of Asiatic Researches (p. 447), that Jayachandra was son of Vijayachandra; and that there has been a mistake in considering Vijayachandra and Jayachand to be equivalent Sanskrit and Hindí appellations of the same individual. The error originated with the *paṇḍit* Sarvoru Trivedí, who communicated a copy of the inscription noticed in the ninth volume of the Asiatic Researches (see pages [240] and [286] of the present volume), as relative to Jayachand, whom he identified (erroneously, as now appears) with Vijayachandra.

The series of princes who reigned at Gádhipura or Kányakubja, ancestors of Jayachandra, is now completely and accurately determined; and the reading of the inscription in question ceases to be a matter of any interest. [Note from *Transact. R. A. S.* p. 462.]

[2] Transactions of the Royal Asiatic Society, vol. i. p. 147.

[3] In two stanzas of Vasantatilaka metre.

[4] Kalahaṇḍi; written Kalahaṇḍí, with a long vowel, in the prose paraphrase.

[5] The text exhibits, in two places, *kutámbra:* which, I conjecture, should be

from the thievish slaves of the sovereign of Gádhinagara,[1] by priests sprung from Suvalluhala:[2] there is no ground of faith to be put therein by the people around. Not a bit of land, so much as a needle's point might pierce, is theirs.

"Samvat 1229. Jyeshṭha-badi 3rd, Wednesday.

[296] "The feet of the sovereign of Japila, the great chieftain, the fortunate Pratápa-dhavala-deva, declare the truth to his sons, grandsons, and other descendants sprung of his race: this ill copper [grant] of the villages of Kalahaṇḍí and Badayitá, obtained by fraud and bribery, from the thievish slaves of the fortunate Vijaya-chandra, the king, sovereign of Kányakubja, by Swalluhaníya folks: no faith is to be put therein. Those priests are every way libertines. Not so much land, as might be pierced by a needle's point, is theirs. Knowing this, you will take the share of produce and other dues; or destroy.

"[Signature] of the great Rájaputra (king's son), the fortunate Śatrughna."

ku-támra, from *ku*, 'ill,' and *támra*, 'copper;' alluding to a grant inscribed, as usual, upon copper. There may be an allusion to Kutámba, the name of a district in that vicinity.

[1] Gádhinagara, the same with Gádhipura, is identified with Kányakubja.—See As. Res., vol. ix. p. 441 (p. [286] of the present volume).

[2] Suvalluhala; written Swalluhaníya in the prose paraphrase; it appears to be the designation of the Bráhmaṇas, who had obtained the grant of land in question.

XII.

ON THREE GRANTS OF LAND, INSCRIBED ON COPPER, FOUND AT UJJAYANÍ, AND PRESENTED BY MAJOR JAMES TOD TO THE ROYAL ASIATIC SOCIETY.[1]

[From the *Transactions* of the Royal Asiatic Society, vol. i. pp. 230—239, and 462—466.]

[297] THE translations, which accompanied the Sanskrit inscriptions on copper, presented to the Society by Major Tod, having been made through the medium of an interpreter, I have thought it right to re-examine the originals, at the same time that I undertook the deciphering of a third inscription, likewise presented by Major Tod, but unaccompanied by a translation.

Neither of the three inscriptions in question is complete. They had originally consisted of a pair of plates in each instance; as is evident, both from the contents, and from the very appearance; for they exhibit holes, through which rings were no doubt passed to hold the plates together. In one instance, it is the last of the pair, which has been preserved. In the two others, the first of each remains, and the last has been lost. Enough, however, subsists, in these fragments of inscriptions, to render them useful historical documents; as is amply shown in the very interesting comments on them which Major Tod has communicated.[2]

[1] Read at a public meeting of the Royal Asiatic Society, December 4, 1824.

[2] [*Transact.* R. A. S., vol. i. pp. 207-226.]

I now lay before the Society a transcript of the contents of each plate, as read by me; and copies, fac-simile, of the originals. My own translations follow; and notes will be found annexed.

[298] On collating the fac-simile with the transcript, the learned reader will observe that errors (for engravers are not less apt, than ordinary copyists, to commit blunders) have been in several places corrected. Where the mistake and requisite correction seem quite obvious, I have in general thought it needless to add a remark. But, wherever it has appeared necessary to give a reason for an emendation, an explanatory note is subjoined.

All these inscriptions are grants of land, recorded upon copper, conformably with the usage of the Hindus, and the direction of the law, which enjoins that such grants should either be written upon silk, or inscribed upon copper.[1]

One of these grants or patents records a donation of land made by the reigning sovereign of Dhárá, on the anniversary of the death of his father and predecessor, in 1191 of the Samvat era; confirmed by the prince his son, at the time of an eclipse of the moon, in Śrávaṇa 1200 Samvat. It appears from calculation that a lunar eclipse did occur at the time; *viz.* on the 16th of July A.D. 1144, about 9½ P.M. apparent time, at Ujjayaní.

This date, so authenticated, becomes a fixed point, whence the period, in which the dynasty of sovereigns of Dhárá flourished, may be satisfactorily computed. The series of four princes, whose names are found in these patents, two of them anterior to A.D. 1134 (1190 Samvat), and two of them subsequent to that date (for the anniversary of Nara-varma's funeral rites in 1191 determines his demise in 1190 Samvat), may be taken to extend from the latter part of the eleventh century of the Christian era to near the close of the twelfth. It is carried retrospectively, through a line of three more

[1] *Digest of Hindu Law*, vol. ii. p. 278. As. Res., vol. ii. p. 50.

princes, to Sindhu, grandfather of Rájá Bhoja, by the marble at Madhukara-ghar, and other evidence; as shown by Major Tod.

[299] The earliest of the three patents inscribed upon copper, which were procured by Major Tod at Ujjayaní, bears the date of 3rd Mágha-śudi 1192 Samvat, answering to January A.D. 1137. It has the signature of Yaśovarma-deva, who, in the preceding year, 1191 Samvat, had made a donation of land on the anniversary of the demise of his father Nara-varma-deva, which was confirmed (apparently in Yaśo-varma's lifetime) by his son Lakshmí-varma-deva, in 1200 Samvat: as above noticed. The latest of the three grants is by his successor Jaya-varma-deva, and being incomplete, exhibits no date. Both these patents agree in deducing the line of succession from Udayáditya-deva, predecessor of Nara-varma. There is consequently this series perfectly authenticated:[1]

UDAYÁDITYA-DEVA
|
NARA-VARMA-DEVA
|
YAŚOVARMA-DEVA
/ \
JAYA-VARMA-DEVA. LAKSHMÍ-VARMA-DEVA.

No. 1.

A Grant of Land inscribed on Copper, found at Ujjayaní.[2]

ओं स्वस्ति ॥ श्री जयोऽभ्युदयश्च ॥ जयति व्योमकेशोऽसौ यः सर्गाय बिभर्त्ति ताम् । ऐन्दवीं शिरसा लेखां जगद्बीजाङ्कुराकृतिम् ॥ तन्वन्तु

[1] [For a further list of this dynasty see Journal of the Bombay branch of R.A.S. 1843, p. 263.]

[2] See Plate iv. [omitted in this edition].

वः स्मरारातेः कल्याणमनिशं जटाः। कल्पान्त[300]समयोद्दामतडिद्-
वलयपिङ्गलाः ॥ परम भट्टारक महाराजाधिराज परमेश्वर श्री उद-
यादित्यदेवपादानुध्यात परम भट्टारक महाराजाधिराज परमेश्वर
श्री नरवर्म्मदेवपादानुध्यात परम भट्टारक महाराजाधिराज परमेश्वर
श्री यशोवर्म्मदेवपादानुध्यात समस्तप्रशस्तोपेतसमधिगतपंचमहाशब्दा-
लंकारविराजमान महाकुमार श्री लक्ष्मीवर्म्मदेवः ॥ श्री महा द्वादश-
कमण्डले श्री राजशासनभोगे सुरासणी सम्बद्ध वडउद्ग्राम तेप्पासुवर्ण
प्रासादिका सम्बद्ध उथवणकग्रामयोः समभूतिषयिक[1] पट्टकिल जनपदा-
दीन्ब्राह्मणोत्तरान्बोधयत्यस्तु वः संविदितम् ॥ यथा श्रीमद्धारायां
महाराजाधिराज परमेश्वर श्री यशोवर्म्मदेवेन श्री विक्रम कालातीत
सम्वत्सरैकनवत्यधिकशतैकादशेषु कार्त्तिकशुदि अष्टम्यां संजात महाराज
श्री नरवर्म्म देव साम्वत्सरिके तीर्थाम्भोभिः स्नात्वा देवर्षिमनुष्य-
पितृंस्तर्प्पयित्वा भगवन्तं भवानीपतिं समभ्यर्च्य शमीकुशतिलान्नाद्याहु-
तिभिर्हिरण्यरेतसं हृत्वा[2] भानवे अर्घ्यं विधाय कपि[301]लां त्रिः
प्रदक्षिणीकृत्य संसारस्यासारतां दृष्ट्वा नलिनीदलगतजललवतरलतरं
जीवितं धनं चावेक्ष्य। उक्तंच। वाताभ्रविभ्रममिदं वसुधाधिपत्यमा-
पातमात्रमधुरो विषयोपभोगः। प्राणास्तृणाग्रजलबिन्दुसमा नराणां
धर्म्मः सखा परमहो परलोकयाने॥ एवमाकलय्य अद्रेलवद्यावरि स्थान
विनिर्गत भरद्वाजगोत्राय भरद्वाज आङ्गिरस बार्हस्पत्य त्रिप्रवराय
आश्वलायनशाखिने दाक्षिणायात कर्णाट ब्राह्मण द्विविद ठक्कुर श्री
महिरस्वामिपौत्र श्री विश्वरूपसुत आवसथिक श्री धनपालाय उपरि
लिखित वडउद ग्राम उथवणक ग्रामौ सवृक्षमालाकुलौ निधिनिक्षेप
सहितौ वापी कूप तडागान्वितौ चतुष्कंकटविशुद्धौ चंद्रार्क्कयावदुदक-
पूर्व्वकतया शासनेन प्रदत्तौ। सम्वत्सर शतद्वादशकेषु श्रावण शुदि
पंचदश्यां सोम ग्रहण पर्वणि श्रीमत्पितृश्रेयोर्थं पुनरेवास्माभिः एतौ
ग्रामौ उदकपूर्व्वकतया शासनेन प्रदत्तौ । तदनयोर्ग्रामयोर्न्निवासि
समस्त पट्टकिलादिलोकैस्तथा कर्षकैश्च यथोत्पद्यमान करहिरण्यभा-
[302]गभोगादिकमाज्ञाश्रवणविधेयैर्भूत्वा सर्व्वममुष्मै समुपनेतव्यम् ।

[1] [समस्तविषयिक-? Cf. J. Am. O. S. vii. 45.]   [2] [हुत्वा?]

सामान्यं चै तत्फलं बुद्धा अस्मद्वंशजैरन्यैरपि भाविभूपतिभिः धर्म्मा-
दायोऽयं मन्तव्यः पालनीयश्चेति। यतो बहुभिर्वसुधा भुक्ता राजभिः
सगरादिभिः। यस्य यस्य यदा भूमिस्तस्य तस्य तदा फलम्॥ स्वदत्तां
परदत्तांवा यो हरेत वसुंधराम्। षष्टिवर्षसहस्राणि विष्ठायां जायते
क्रिमिः॥ सर्व्वानेतान्भाविनः पार्थिवेन्द्रान् भूयो भूयो याचते रामभद्रः।
सामान्योऽयं धर्म्मसे [तुः]

"Om! Well be it! Auspicious victory and elevation![1]

"Victorious is he, whose hair is the ethereal expanse;[2] who, for creation, supports with his head that lunar line[3] which is a type of the germ in the seed of the universe.

"May the matted locks of love's foe,[4] reddened by the lightning's ring, that flashes at the period of the world's end, spread for you nightless[5] prosperity.

"The great prince,[6] resplendent with the decoration of [303] five great titles,[7] with which he is thoroughly and excellently imbued and possessed, the fortunate Lakshmí-varma-deva, son[8] of his Majesty,[9] the great king, sovereign, and supreme lord, the fortunate Yaśo-varma-deva, son of Nara-varma-deva, son of Udayáditya-deva, acquaints the Paṭ-

[1] Both this and the following inscription begin alike, and contain several other parallel passages. There are gross errors in both; but one has helped to correct the other.

[2] Vyomakes'a, a title of S'iva, whose hair is the atmosphere.

[3] The crescent, which is S'iva's crest.

[4] Smarárâti, a title of S'iva. He is represented with his hair clotted and matted in a long braid rolled round his head, in the manner in which ascetics wear theirs. Hair in that state has a tawny hue.

[5] Nightless, endless: eternal.

[6] Mahákumára: a royal youth, a young prince.

[7] I am not entirely confident of the meaning of this passage. [Cf. Journ. Amer. O. S. vi. 540.]

[8] *Páddnudhyáta*, an ordinary periphrasis for son and successor: literally, "whose feet are meditated, *i.e.* revered, by........." [But cf. Journ. Bombay Branch R. A. S., Jan. 1851, pp. 219 and 220.]

[9] The additions are those usually borne by sovereign princes among the Hindus. Bhaṭṭáraka answers to the title of majesty. Adhirája is a sovereign or superior prince. S'rí, signifying fortunate or auspicious, is prefixed to every name.

Varman is the customary designation of a Rájaputra; as S'arman is of a Bráhmaṇa. The term enters into composition in the names of many of this family.

ṭakila [10] and people, Bráhmaṇas and others, inhabiting Baḍäuda-gráma,[11] dependent on Surásaṇí, and Uthavaṇaka-gráma [12] appertaining to Teptá-suvarṇa-prásádiká,[13] both situated in the twelve great districts [14] held by royal patent; be it known unto you: Whereas, at the fortunate Dhárá,[15] the great king, sovereign, supreme lord, the fortunate Yaśo-varma-deva, upon the anniversary [16] of the great king, the fortunate Nara-varma-deva, which [304] took place on the 8th of Kárttika-śudi, years eleven hundred and ninety-one elapsed since Vikrama, having bathed with waters of holy places, having satisfied gods, saints, men and ancestors with oblations,[17] having worshipped the holy Bhawánípati,[18] having sacrificed to fire offerings of *śami*, sacrificial grass, sesamum and boiled rice,[19] having presented an *arghya* [20] to the sun, having thrice perambulated Kapilá,[21] seeing the vanity of the world, deeming life a tremulous drop of water on the leaf of a lotus, and reckoning wealth despicable:—As it is said:

[10] Paṭṭakila is probably the Paṭṭaïl of the moderns. The term occurs again lower down; and also in the next grant (No. 2).

[11] Pronounce Baräud-grám. Surásaṇí appears to be the district, or province, in which it is situated.

[12] Perhaps Ughavan rather than Uthavan.

[13] This seems to be the name of a district.

[14] An apanage, comprising twelve great districts. Mahá-dwádaśaka-maṇḍala seems to have been held by this prince, under a royal grant from his father. He did not become his successor: for Jaya-varma is, in another inscription, named immediately after Yaśo-varma; and was reigning sovereign.

[15] Dhárá was the capital of this dynasty.

[16] Anniversary of the death. It appears, therefore, that Nara-varma died in 1190 Samvat.

[17] The allusion is to the five great sacraments, which a Hindu is bound to perform.—See Manu, iii. 67.

[18] Bhawánípati is a title of S'iva, husband of Bhawání. In the following inscription, the name again occurs in a similar manner, with the further designation of Varávara-guru.

[19] The *áhuti*, or burnt offering; consisting of boiled rice, with *tila* (Sesamum orientale), *kuśa* (Poa cynosuroides), and *śamí* (Adenanthera or Prosopis aculeata).

[20] An *arghya* is a libation or oblation, in a conch, or vessel of a particular form, approaching to that of a boat.—As. Res., vol. vii. p. 291.

[21] Kapilá probably is fire, personified as a female goddess. [Rather a red cow, —"when applied to a cow, this term signifies one of the colour of lac-dye, with black tail and white hoofs." Colebr. *Two Treatises on the Hindu Law of Inheritance*, quoted by Dr. F. Hall, *Sánkhya S.* pref. p. 20.]

"This sovereignty of the earth totters with the stormy blast;[22] the enjoyment of a realm is sweet but for an instant; the breath of man is like a drop on the tip of a blade of grass: virtue is the greatest friend in the journey of the other world.—

"Considering this, did grant by patent, preceded by gift of water,[23] for as long as the sun and moon shall endure, [305] unto the A'vasathika[24] the fortunate Vana-pála,[24*] son of the fortunate Viśwarúpa, grandson of the fortunate Mahira-[25]swámi, a venerable Bráhmaṇa of Karnáṭa in the south, who studies two *vedas*[26] and appertains to the A'śwaláyana[27] Śákhá, sprung from the race of Bharadwája,[28] and tracing a triple line of descent, Bháradwája, A'ngirasa, and Várhaspatya,[29] settled at Adrelavaddhávaristhána,[30] the aforesaid Baḍaüda-gráma and Uthavaṇaka-gráma, with their trees, fields and

[22] *Abhra* is a 'cloud'; and *váta*, 'wind': whence *vátábhra*, 'a windy cloud.' Or *abhra* may signify the ethereal fluid (*ákáśa*). The stanza is repeated in the next inscription.

[23] A requisite formality in a donation of land.—See *Digest of Hindu Law*, vol. ii. p. 276. *Treatises on Law of Inheritance*, p. 258.

[24] Erroneously written A'vasthika in the text. Its derivation is from *ávasatha*, 'a house': and it bears reference to the householder's consecrated fire (*gárhapatya*). Haláyudha, author of the Bráhmaṇa-sarvaswa, has, in the epigraph of his work, the title of A'vasathika-mahá-dharmádhyaksha.

[24*] On a reperusal of the grant No. 1, it appears probable that the grantee's name was Dhanapála instead of Vanapála. Throughout the inscription, the letter ध has for the most part the appearance of व, the detached stroke ट being defaced: and Dhanapála is doubtless the more ordinary name.

[25] This probably should be Mihira, which is a name of the sun.

[26] *Dwivid* is one who studies two *vedas*: as *Trivid*, one who studies three. [The facsimile has *dwiveda*.]

[27] The text exhibits *A'śláyana*; doubtless for *A'śwaláyana*, by which name one of the *śákhás* of the *veda* is distinguished. A'śwaláyana is author of a collection of aphorisms on religious rites (Kalpa-sútra).

[28] *Gotra*, 'descent from an ancient sage' (Ṛishi), whence the family name is derived. There are four such great families of Bráhmaṇas; comprehending numerous divisions.

[29] *Pravara*, 'lineage traced to more of the ancient sages.' The distinction between *gotra* and *pravara* is not very clear. Mádhava on the Mímánsá, 2, 1, 9, names these very three families as constituting a *gotra*: and gives it as an example of *pravara*. [On *pravara*, see Prof. Müller, *Ancient Sanskrit Literature*, p. 386, and Prof. Haug, *Ait. Brahm.* vol. ii. p. 479.]

[30] This, which seems to be the name of a country, is differently written in the next inscription. Perhaps it may be a branch of the *gotra*, or family, from which the donatory derived his descent.

habitations,[31] together [306] with hidden treasure, and deposits, and adorned with ponds, wells and lakes.

"On the 15th of Śrávaṇa-śudi in the year 1200, at the time of an eclipse of the moon,[32] for our father's welfare, we have again granted those two villages by patent with the previous gift of water; therefore all inhabitants of both villages, as well the Paṭṭakila and other people, as husbandmen, being strictly observant of his commands, must pay unto him all dues as they arise, tax, money-rent, share of produce,[33] and the rest.

"Considering the fruit of this meritorious act as common, future princes sprung of our race, and others, should respect and maintain this virtuous donation accordingly.[34]

"By many kings, Sagara as well as others, the earth has been possessed. Whose-soever has been the land, his has then been the fruit.[35]

"He, who resumes land, whether given by himself, or granted by others, is regenerated a worm in ordure, for 60,000 years.[36]

[307] "Rámabhadra again and again exhorts all these future rulers of the earth: this universal bridge of virtue . . . . . ."[37]

(The remainder, upon another plate, is wanting.)

[31] *Mála* signifies 'field'; and *kula*, 'abode.' The passage may admit a different interpretation. [For *chatuḥ-kankaṭa-viśuddha* see J. Am. O. S. vi. 42.]

Mála implies (as I learn from Major Tod), according to the acceptation of the country, land not artificially irrigated, but watered only by rain and dew.

[32] An eclipse of the moon appears, from calculation, to have taken place at the time here assigned to it: *viz.* 16th July, 1144; as in the preceding year, 28th July, 1143.—*Art de vérifier les Dates*, vol. i. p. 73.

[33] *Hiraṇya*, 'gold': 'rent in money.'

Bhága-bhoga; in another place, *bhágábhoga*,—'share of produce,' 'rent in kind.'

[34] This stanza, a little varied, recurs in the third grant (No. 3).

[35] This also recurs in the same (No. 3); and is likewise found in a grant translated by Sir William Jones.—As. Res., vol. i. p. 365, st. 1.

[36] A quotation.—See *Digest of Hindu Law*, vol. ii. p. 281, and As. Res, vol. ii. p. 53. Also vol. i. p. 366; and vol. viii. p. 419.

[37] The remainder of the stanza (which may be easily supplied from the other inscriptions: see the next grant; and As. Res., vol. i. p. 365, st. 3, and vol. iii. p. 53, and vol. viii. p. 419) was probably followed, in the second plate, by further

No. 2.

A Grant of Land, inscribed on Copper, found at Ujjayani.[1]

ओं स्वस्ति श्री जयो ऽभ्युदयश्च ॥ जयति व्योमकेशोऽसौ यः सर्गाय बिभर्त्ति ताम् । ऐंदवीं शिरसा लेखां जगद्बीजांकुराकृतिम् ॥ तन्वंतु वः स्मरारातेः कल्याणमनिशं जटाः । कल्पान्तसमयोद्दामतडिद्वलयपिंगलाः ॥ श्री वर्द्धमानपुर समावासात् परम भट्टारक महाराजाधिराज परमेश्वर श्री उदयादित्यदेवपादानुध्यात परम भट्टारक महाराजाधिराज परमेश्वर श्री नरवर्म्मदेवपादानुध्यात परम [308] भट्टारक महाराजाधिराज परमेश्वर श्रीयशोवर्म्मदेवपादानुध्यात परम भट्टारक महाराजाधिराज परमेश्वर श्रीमज्जयवर्म्मदेवो विजयोदयी ॥ वटखेटक-षट्त्रिंशत्संबद्ध मायमोडकग्रामे समस्तराजपुरुषान् ब्राह्मणोत्तरान्प्रति-निवासि पट्टकिल जनपदादींश्च बोधयत्यस्तु वः संविदितं यथा । चंद्रपुरी समावासितैरस्माभिः स्नात्वा चराचरगुरुं[2] भगवंतं भवानीपतिं समभ्यर्च्य संसारस्यासारतां दृष्ट्वा. तथा हि । वाताभ्रविभ्रममिदं वसु-धाधिपत्यमापातमात्रमधुरो विषयोपभोगः । प्राणास्तृणाग्रजलबिंदु-समा नराणां धर्म्मः सखा परमहो परलोकयाने ॥ भ्रमत्संसारचक्रा-ग्रधाराधारामिमां श्रियम् । प्राप्य ये न ददुस्तेषां पश्चात्तापः परं फलम् ॥ इति जगतो विनश्वरं स्वरूपमाकलय्यादृष्टफलमुररीकृत्य चंद्रार्कार्णवक्षितिसमकालं यावत्परया भक्त्या राजब्रह्मपुर्यां दक्षिणदे-शान्तःपाति श्वद्रियग्रविद्यावरीस्थानविनिर्गताय भारद्वाज—

"Om! Well be it! Auspicious victory and elevation!

"Virtuous is he, whose hair is the ethereal expanse; who, for creation, supports with his head that lunar line [309] which is a type of the germ contained in the seed of the universe.

quotations, deprecating the resumption of the gift by future sovereigns: and to which was subjoined the sign manual, with the names of attesting officers; as in the accompanying grant by Yaśo-varma (No. 3).

The bridge of virtue, which signifies "the maxim of duty," bears an allusion to Ráma's bridge, to cross the sea to Lanká.

[1] See Plate v. [omitted in this edition].

[2] [*Chardcharagurum?* Cf. J. Am. O. S. vi. 532.]

"May the matted locks of love's foe, reddened by the lightning's ring, that flashes at the period of the world's end, spread for you nightless prosperity.[1]

"From his abode at the auspicious Bardhamánapura, his Majesty, the great king, sovereign, and supreme lord, the fortunate Jaya-varma-deva, whom victory attends, son of Yaśo-varma-deva, son of Nara-varma-deva, son of Udayáditya-deva, acquaints all king's officers, Bráhmaṇas and others, and the Paṭṭakila and people, etc., inhabiting the village of Máyamoḍaka which appertains to the thirty-six villages of Vaṭa:[2] Be it known unto you: Whereas we, sojourning at Chandrapurí, having bathed, having worshipped the holy, beneficent and adorable Bhawánípati:—

Considering the world's vanity:

for

"This sovereignty of the earth totters with the stormy blast;[3] the enjoyment of a realm is sweet but for an instant; the breath of man is like a drop of water on the tip of a blade of grass: virtue is the greatest friend in the journey of the other world.—

"Having gained prosperity, which is the receptacle of the skips and bounds[4] of a revolving world, whoever give not donations, repentance is their chief reward.—

"Reflecting on the perishable nature of the world, prefer-[310]ring unseen (spiritual) fruit, [do grant] to be fully possessed, so long as moon and sun, sea and earth, endure [unto........sprung from the race] of Bharadwája[5]...........

[1] These two stanzas occur also in the preceding inscription.

[2] *Vaṭa-khedaka-shaṭ-trinśat*, 'thirty-six villages of Vaṭa': for it should probably be read *kheṭaka* (which signifies a village) instead of *khedaka*.

[3] [Or "like a cloud driven by the wind."]

[4] *Valgágra-dhárá-dhárá*: an allusion is probably intended to Dhárá the seat of government of this dynasty. *Valga* signifies a 'leap'; and *dáhra*, a 'horse's pace.' [The true reading for *valga* is *chakra*, see B. A. S. J. 1861, p. 207, "having gained prosperity, which abides on the topmost edge of the revolving world's wheel."]

[5] The grantee was either the same person, or one of the same family, as in the preceding grant; for the designations are identical, so far as this reaches.

settled at Adriya-lambi-dávarí-sthána, situated within the southern region, at Rája-brahma-purí........." ·

(The remainder, inscribed on a separate plate, is wanting.)

No. 3.

A Grant of Land, inscribed on Copper, found at Ujjayant.[1]

श्री मोमल देवी सांवत्सरिक कल्पितस्नानुध्यमान देवल पाटका-
डूदल द्वय परिवर्त्तेन ब्राह्मणमाप्य कोयत्तदलद्वय सम्बद्ध मोकरिका-
ग्राम विभाग उभयजन द्वाभ्यां भूनिवर्त्तन सप्तदशकोपेतभूहलिकादशक
सम्बद्ध समस्त उपरि लिखित लघु वैङ्गणपद्रग्रामस्तथा विङ्करिकाग्रा-
मार्द्धस्व स्वसीमा तृणयति[2] गोचर पर्य्यन्तः सवृक्षमालाकुलः सहिरण्यभा-
गभोगः सोपरिकरः सर्व्वादायसमेतश्च मातापित्रोरात्मनश्च पुण्यय-
शोभिवृद्धये शासनेनोदकपूर्व्वकतया प्रदत्तस्तन्मत्वा यथा दीयमान
भागभोग कर हिरण्यादिकमाज्ञाश्रवणविधेयैर्भूत्वा सर्व्वमेताभ्यां समु-
[311] पनेतव्यम् ॥ सामान्यं चै तत्पुण्यफलं बुद्धाऽस्मद्वंशजैरन्यैरपि भा-
विभोक्तृभिरस्मत्प्रदत्त धर्म्मादायोऽयमनुमन्तव्यः पालनीयश्च । उक्तंच ॥
बहुभिर्वसुधा भुक्ता राजभिः सगरादिभिः : यस्य यस्य यदा भूमिस्तस्य
तस्य तदा फलम् ॥ यानीह दत्तानि पुरा नरेन्द्रैर्दानानि धर्म्मा-
र्थयशस्कराणि निर्म्माल्यवन्ति प्रतिमानि तानि को नाम साधुः पुनरा-
ददीत ॥ अस्मत्कुलक्रममुदारमुदाहरद्भिरन्यैश्च दानमिदमभ्यनुमोद-
नीयम् । लक्ष्म्यास्तडिद्दलयबुद्बुदतुंदिलाया दानं फलं परयशःपरिपा-
लनं च ॥ सर्व्वानेतान्भाविनः पार्थिवेन्द्रान्भूयो भूयो याचते रामभद्रः ।
सामान्योऽयं धर्म्मसेतुर्नृपाणां काले काले पालनीयो भवद्भिः ॥ इति
कमलदलाम्बुबिंदुलोलां श्रियमनुचिंत्य मनुष्यजीवितं च सकलमिदमु-
दाहृतं बहुधा[3] नहि पुरुषैः परकीर्त्तयो विलोप्या इति ॥

सम्वत् ११९२ माघवदि३ बू० पुरोहित ठक्कुर श्री वामन स्वामि
ठक्कुर श्री पुरुषोत्तममहाप्रधान राजपुत्र श्री देवधर प्रभृतयः ॥

मंगलं महा श्रीः ॥

[1] See plate vi. [omitted in this edition].

[2] [तृणयूति, Bengal A. S. Journ. 1858, p. 230.]

[3] [च बुद्धा, See Bengal A. S. Journ. 1861, p. 210.]

[312] . २

स्वहस्तोऽयं महाराज श्रीमद्यशोवर्म्मदेवस्य

स्वस्ति ॥ श्रीः ॥

(The beginning, inscribed upon another plate, is wanting).

"In respect of two portions [1] of Bráhmaṇa's allowance, by exchange for two portions allotted to the attendant of the temple and the reader, to be held as assigned for the anniversary of the auspicious Momala-deví; [2] and in respect of seventeen *nivartanas* [3] of land, with eleven ploughs of land, assigned to both persons in a partition of Víkariká-gráma; [4] the whole of the aforesaid little Vainganapadra-gráma, also a moiety of Vikkariká-gráma within the proper bounds, extending to the grass and pasture, with trees, fields and habitations, with money-rent, and share of produce, with superior taxes, and including all dues; for increase of merit and fame of my mother, of my father, and of myself, are granted by patent, with the [313] previous gift of water. Aware of this, and obedient to his commands, they must pay all due share of produce, taxes, money-rent, etc. to them both.

"Considering the fruit of this meritorious act as common, future princes, sprung of our race, and others, should respect and maintain this virtuous donation, as by us given.

"And it is said,—By many Kings, Sagara as well as others,

[1] For want of the first plate of this patent, the beginning of the second is very obscure; and, perhaps, not rightly intelligible, without divining what has gone before. I have endeavoured to make sense of it, but am far from confident of having succeeded.

[2] Momala-deví was not improbably the name of Yaśo-varma's mother; and the anniversary is that of her obsequies: as in the preceding patent for a grant on the anniversary of the obsequies of Yaśo-varma's father. Else it may be the annual festival of an idol of that name.

[3] *Nivartana* is a land-measure containing 400 square poles of ten cubits each, according to the *Lílávati*. See *Algebra of the Hindus*.

[4] The name is written Víkariká-gráma in one place; and Vikkariká-gráma in another.

Major Tod observes that the ancient name of Burhánpura is Kari-gráma.

the earth has been possessed. Whose-soever has been the land, his has then been the fruit.

"The gifts, which have been here granted by former princes, producing virtue, wealth, and fame, are unsullied reflections.[5] What honest man would resume them?

"This donation ought to be approved by those who exemplify the hereditary liberality of our race, and by others. The flash of lightning from Lakshmí swoln with the rain-drop,[6] is gift; and the fruit is preservation of another's fame.

"Rámabhadra again and again exhorts all those future rulers of the earth: this universal bridge of virtue for princes is to be preserved by you from time to time.

"Considering therefore prosperity to be a quivering drop of water on the leaf of a lotus; and the life of man is such; and all this is many ways[7] exemplified; men therefore should not abridge the fame of others.

"Samvat 1192, 3rd of Mágha-badi (dark half); witness [314] the venerable *purohita*, Vámana; the venerable *swámi*, Purushottama; the prime minister and king's son, Devadhara; and others.

"Auspiciousness and great prosperity.

R.

"This is the sign manual of the fortunate Yaśovarma-deva."

Adhi. Śrí.

[5] [*Nirmályavanti pratimáni*, but the fac-simile has *vánti*. Other inscriptions read *nirmálya-vánta-pratimáni*, "Gifts once given are like the remains of an offering or vomitings," *i.e.* are not to be used again, see B. A. S. J. 1858, p. 238.]

[6] I have here hazarded a conjectural emendation; being unable to make sense of the text, as it stands. Perhaps the transcriber had erroneously written *tundalá* for *tundilá;* and the engraver, by mistake, transformed it into the unmeaning *vandalá*, which the text exhibits. Lakshmí is here characterized as a thunder-cloud pregnant with fertilizing rain. [The true reading is *Chanchaláyáḥ*. Cf. B. A. S. J. 1861, p. 210. "Fruitful is the giving away of fortune, which is transient as a bubble or the lightning-flash; and so too the preservation of another's fame."]

[7] *Chanudhá*, in the text, is an evident mistake; it should undoubtedly be *bahudhá*. [The true reading is *cha buddhwá*.] Several other gross errors in this inscription have been corrected; too obviously necessary to require special notice: as a short vowel for a long one, and *vice versá*.

XIII.

ON INSCRIPTIONS AT TEMPLES OF THE JAINA SECT IN SOUTH BIHÁR.[1]

[From the *Transactions* of the Royal Asiatic Society, vol. i. pp. 520–523.]

[315] As connected with the subject of an essay on the Śráwaks or Jainas,[2] read at a former meeting, I lay before the Society copies of inscriptions found by Dr. Buchanan Hamilton in South Bihár. Though not ancient, they may be considered to be of some importance, as confirming the prevalence of a Jaina tradition relative to the site of the spot where the last of the Jinas terminated his earthly existence, and as identifying the first of his disciples with Gautama, whose death and apotheosis took place, according to current belief, in the same neighbourhood.

In the Kalpa-sútra and in other books of the Jainas, the first of Mahávíra's disciples is mentioned under the name of Indra-bhúti: but, in the inscription, under that of Gautama-swámí. The names of the other ten precisely agree: whence it is to be concluded, the Gautama, first of one list, is the same with Indra-bhúti, first of the other.

It is certainly probable, as remarked by Dr. Hamilton and Major Delamaine, that the Gautama of the Jainas and of the Bauddhas is the same personage: and this [316] leads to the further surmise, that both these sects are branches of one

[1] Read at a Public Meeting of the Royal Asiatic Society, November 18th, 1826.

[2] By Major James Delamaine. Transactions of the Royal Asiatic Society, vol. i. pp. 413—438.

stock. According to the Jainas, only one of Mahávíra's eleven disciples left spiritual successors: that is, the entire succession of Jaina priests is derived from one individual, Sudharma-swámí. Two only out of eleven survived Mahávíra, *viz.* Indrabhúti and Sudharma:[1] the first, identified with Gautama-swámí, has no spiritual successors in the Jaina sect. The proper inference seems to be, that the followers of this surviving disciple are not of the sect of Jina, rather than that there have been none. Gautama's followers constitute the sect of Bauddha, with tenets in many respects analogous to those of the Jainas, or followers of Sudharma, but with a mythology or fabulous history of deified saints quite different. Both have adopted the Hindu Pantheon, or assemblage of subordinate deities; both disclaim the authority of the *vedas;* and both elevate their pre-eminent saints to divine supremacy.

In a short essay on their philosophical opinions, which will be likewise submitted to the Society, it will be shown that a considerable difference of doctrine subsists on various points: but hardly more between the two sects, than between the divers branches of the single sect of Bauddha.

It deserves remark, that the Bauddhas and the Jainas agree in placing within the limits of the same province, South Bihár, and its immediate vicinity, the locality of the death and apotheosis of the last Buddha, as of the last Jina, and of his predecessor and his eldest and favourite disciple. Both religions have preserved for their sacred language the same dialect, the Páli or Prákrit, closely resembling the Mágadhí or vernacular tongue of Magadha (South Bihár). Between those dialects (Páli [317] and Prákrit) there is but a shade of difference,[2] and they are often confounded under a single name.

The traditional chronology of the two sects assigns nearly the same period to their Gautama respectively: for, according to the Bauddhas, the apotheosis of Gautama-buddha took

[1] Page [216] of the present volume.
[2] Burnouf et Lassen, *Essai sur le Páli*, p. 154.

place 543 years before the beginning of the Christian era; and according to the Jainas, the apotheosis of Mahávíra, Gautama-swámí's teacher, was somewhat earlier, *viz.* about 600 years before the Christian era. The lapse of little more than half a century is scarcely too great for the interval between the death of a preceptor and of his pupil; or not so much too great as to amount to anachronism.

Without relying much upon a similarity of name, it may yet not be foreign to remark, that the Buddha, who preceded Gautama-buddha, was Káśyapa: and that Mahávíra, the preceptor of Gautama-swámí, was of the race of Káśyapa.

I take Párśwanátha to have been the founder of the sect of Jainas, which was confirmed and thoroughly established by Mahávíra and his disciple Sudharma; by whom, and by his followers, both Mahávíra and his predecessor Párśwanátha have been venerated as deified saints (Jinas), and are so worshipped by the sect to this day.

A schism, however, seems to have taken place, after Mahávíra, whose elder disciple, Indra-bhúti, also named Gautama-swámí, was by some of his followers raised to the rank of a deified saint, under the synonymous designation of Buddha (for Jina and Buddha bear the same meaning, according to both Buddhists and Jainas). The preceding Buddha, according to this branch of the sect, was Káśyapa, who is not improbably the same with [318] Śramaṇa Vardharmána Mahávíra, son (born of the wife) of Siddhártha, a Súryavanśí prince of the Káśyapa race.

It is to be observed, without, however, attaching much weight to this coincidence, that the name of Siddhártha is common to Mahávíra's father and to Gautama-buddha, whom I suppose to be the same with the Jina's disciple, Gautama-swámí.

The appellative Gautama is unquestionably a patronymic (derived from Gotama), however Śákya-sinha may have come by it, whether as descendant of that lineage, nearer

or remoter, or for whatever other cause. His predecessor among Buddhas is, in like manner, designated by a patronymic as above noticed, *viz.* Kásyapa.

The name of Gautama occurs also as an appellative in other instances besides that of the sixth Buddha, or of the twenty-fourth Jina's eldest disciple. One of the legislators of the Hindus is Gautama, whose aphorisms of law are extant.[1]

The gentile name of the last Buddha has prevailed in China and Japan, where he is best known under the designation of Śákya. His appellation of Gautama remains current in countries bordering upon India.[2]

INSCRIPTION AT NAKHAUR.[3]

संवत् १६८६ वर्षे वैशाखे सुदि १५ दिने मंत्री दल वंश चोपरा गोत्रे ठ॰ विमल दास तत्पुत्र ठ॰ तुलसी दास तत्पुत्र ठ॰ संग्राम गोवर्द्धन दास तन्माता ठ॰ नीहालो तस्य भार्या ठ॰ - - देव्या [319] गौतम स्वामिना चरण पद्म - - करापिता बृहत्खरतर गच्छे पूज्य श्री युतीय श्री श्री जिन राज सूरी विद्यमान पु॰ म - - धर्मैति प्रतिष्ठा कृता ॥ ॥

"In the year 1686 Samvat, on the 15th day of Vaiśákha-sudi, the lotus of Gautama-swámí's feet was here placed by Níhálo mother of Ṭha. (Ṭhakkur) Sangráma-govardhana-dása, son of Ṭha. Tulasí-dása, son of Ṭha. Vimala-dása, of the race of Chopará and lineage of [Bharata Chakravartí's] prime councillor: the fortunate Jina-rája-súri, the venerable guide of the great Kharatara tribe, being present."

The same pious family, which is here recorded for erecting, or more probably restoring, the representation of Gautama-swámí's feet at Nakhaur, is in like manner commemorated by three inscriptions, bearing date six years later (*viz.* 1692

[1] Preface to *Two Treatises on the Hindu Law of Inheritance*, p. x.

[2] [The Chinese, however, know the name *Kiu tan.*]

[3] See plate vii. [omitted in this edition].

Samvat),[1] for the like pious office of erecting images of the feet of Mahávíra and of his eleven disciples, at Páwápurí, which, or its vicinity, is in those inscriptions stated to be the site of that saint's extinction (*nirváṇa*) or translation to bliss.

The same names recur, with those of many other persons, inhabitants (as this family was) of the town of Bihár, where a numerous congregation of Jainas seems to have then dwelt; and with the same additions and designations more fully set forth: whence it appears, that the designation of "descendant of a prime councillor" bears reference to a supposed descent from the prime minister of the universal or paramount sovereign, Bharata, son of the first Jina Ṛishabha.

[320] Sangráma and Govardhana, here joined as an appellation of one person, are in those inscriptions separated as names of two brothers, sons of Tulasí-dása and his wife Níhálo. In other respects, the inscriptions confirm and explain each other.[2]

[1] The largest of those inscriptions names likewise the reigning Emperor, Sháh Jahán.

[2] Copies of those at Páwápurí were not taken in fac-simile, but are merely transcripts.

XIV.

ON THE INDIAN AND ARABIAN DIVISIONS OF THE ZODIAC.[1]

[From the *Asiatic Researches*, vol. ix. pp. 323—376. *Calcutta*, 1807. 4to.]

[321] The researches, of which the result is here laid before the Asiatic Society, were undertaken for the purpose of ascertaining correctly the particular stars, which give names to the Indian divisions of the zodiac. The inquiry has, at intervals, been relinquished and resumed: it was indeed attended with considerable difficulties. None of the native astronomers, whom I consulted, were able to point out, in the heavens, all the asterisms for which they had names: it became, therefore, necessary to recur to their books, in which the positions of the principal stars are given. Here a fresh difficulty arose from the real or the seeming disagreement of the place of a star, with the division of the zodiac, to which it was referred: and I was led from the consideration of this and of other apparent contradictions, to compare carefully the places assigned by the Hindus to their *nakshatras*, with the positions of the lunar

[1] [For a full discussion of the history of the Indian *Nakshatras*, see Biot's articles in the *Journal des Savans*, 1840, 1845, 1859, 1860; Whitney's notes to Burgess's translation of the *Súrya-siddhánta*, pp. 176–210 (1860), and his paper in the *Journ. A. O. S.*, vol. viii. and *Journ. R. A. S.*, vol. i. (N. S.); Weber's *Die Vedische Nachrichten von den Naxatra*, 1860, 1862; Müller, *Pref. Rig Veda*, vol. iv. pp. xxxviii–lxx; Burgess, *Journ. A. O. S.* vol. viii. Biot maintained that the Indian *nakshatras* and the Arabian *mandzil* were derived from the 28 Chinese Sieu, 24 of which were fixed about B.C. 2357, and the other 4 about B.C. 1100. The Sieu, according to him, form an integral part of the Chinese system, and they were carefully chosen by the aid of the best instruments at their

mansions,[1] as determined by the Arabian astronomers. After repeated examination of this subject, with the aid afforded by the labours of those who have preceded me in the same inquiry, I now venture to offer to the perusal of the Asiatic Society the following remarks, with the hope that they will be found to contain a correct ascertainment of the stars [322] by which the Hindus have been long accustomed to trace the moon's path.

The question, which I proposed to myself for investigation, appeared to me important, and deserving of the labour bestowed upon it, as obviously essential towards a knowledge of Indian astronomy, and as tending to determine another question; namely, whether the Indian and Arabian divisions of the zodiac had a common origin. Sir William Jones thought that they had not; I incline to the contrary opinion. The coincidence appears to me too exact, in most instances, to be the effect of chance: in others, the differences are only such as to authorize the remark, that the nation, which borrowed from the other, has not copied with servility. I apprehend

command. Prof. Whitney accepted Biot's view in the main, but suggested "that a knowledge of the Chinese astronomy, and with it the Chinese system of division of the heavens into 28 mansions, was carried into Western Asia at a period not much later than 1100 B.C., and was there adopted by some Western people, either Semitic or Iranian. In their hands it received a new form, such as adapted it to a ruder and less scientific method of observation, the limiting stars of the mansions being converted into zodiacal groups or constellations, and in some instances altered in position, so as to be brought nearer to the general path of the ecliptic." It maintained itself in Irán, as we find traces of it in the Bundehesh under the Sassanians; but it also spread into India, and ultimately became known to the Arabs. Prof. Weber held that Babylon was the original birth-place of astronomy, and that the Hindus derived their *nakshatras* from thence, as also probably the Chinese and Arabs respectively their *sieu* and *manásil* (cf. *Ind. Stud.* ix.). Prof. Müller, on the contrary, maintained that the *nakshatras* were an original Indian idea, suggested by the moon's sidereal revolution; that they were intended to mark certain equal divisions of the heavens; and that their number was originally 27, not 28. The Rev. E. Burgess held that the *nakshatras* originated in India, whence they were derived by the Arabians, but that the Chinese *sieu* have no genetic relation with them.]

[1] [The *manzils* are mentioned in the Koran x. 5; xxxvi. 39; and they are probably alluded to in the *mazzároth* of Job xxxviii. 32, and the *mazzáloth* of 2 Kings xxiii. 5.]

that it must have been the Arabs who adopted (with slight variations) a division of the zodiac familiar to the Hindus. This, at least, seems to be more probable than the supposition, that the Indians received their system from the Arabians: we know that the Hindus have preserved the memory of a former situation of the Colures, compared to constellations, which mark divisions of the zodiac in their astronomy; but no similar trace remains of the use of the lunar mansions, as divisions of the zodiac, among the Arabs, in so very remote times.

It will be found that I differ much from Sir William Jones in regard to the stars constituting the asterisms of Indian astronomy. On this, it may be sufficient to remind the reader, that Sir William Jones stated only a conjecture founded on a consideration of the figure of the *nakshatra* and the number of its stars, compared with those actually situated near the division of the ecliptic, to which the *nakshatra* gives name. He was not apprised that the Hindus themselves place some of these constellations far out of the limits of the zodiac.

[323] I shall examine the several *nakshatras* and lunar mansions in their order; previously quoting from the Hindu astronomers the positions assigned to the principal star, termed the *yogatárá.* This, according to Brahmagupta, (as cited by Lakshmídása in his commentary on the Śiromaṇi), or according to the Brahma-siddhánta (cited by Bhúdhara), is the brightest star of each cluster. But the Súrya-siddhánta specifies the relative situation of the Yogatárá in respect of the other stars; and that does not always agree with the position of the most conspicuous star.

The number of stars in each asterism, and the figure under which the asterism is represented, are specified by Hindu astronomers: particularly by Śrípati in the Ratnamálá. These, with the positions of the stars relatively to the ecliptic, are exhibited in the annexed table. It contains the whole purport

of many obscure and almost enigmatical verses, of which a verbal translation would be nearly as unintelligible to the English reader as the original text.

The authorities, on which I have chiefly relied, because they are universally received by Indian astronomers, are the Súrya-siddhánta, Śiromaṇi, and Graha-lághava. They have been carefully examined, comparing at the same time several commentaries. The Ratnamálá of Śrípati is cited for the figures of the asterisms; and the same passage had been noticed by Sir William Jones.[1] It agrees nearly with the text of Vasishṭha cited by Muníśwara, and is confirmed in most instances by the Muhúrta-chintámaṇi. The same authority, confirmed with rare exceptions by Vasishṭha, Śákalya, and the Ábharaṇa, is quoted for the number of stars in each asterism. The works of [324] Brahmagupta have not been accessible to me: but the Maríchi, an excellent commentary on the Siddhánta-śiromaṇi, by Muníśwara, adduces from that author a statement of the positions of the stars; and remarks, that it is founded on the Brahma-siddhánta, contained in the Vishṇudharmottara.[2] Accordingly, I have found the same passage in the Brahma-siddhánta, and verified it by the gloss entitled Vásaná; and I therefore use the quotation without distrust. Later authorities, whose statements coincide exactly with some of the preceding (as Kamalákara in the Tattwa-viveka), would be needlessly inserted: but one (Muníśwara in the Siddhánta-sárvabhauma), exhibiting the position of the stars differently, is quoted in the annexed table.

The manner of observing the places of the stars is not explained in the original works first cited. The Súrya-siddhánta only hints briefly, 'that the astronomer should frame a sphere, and examine the apparent longitude and latitude.'[3] Com-

[1] As. Res., vol. ii. p. 294.

[2] Another Brahma-siddhánta is entitled the S'ákalya-sanhitá. The author of the Maríchi, therefore, distinguishes the one to which he refers. [Colebrooke always writes this as Sákalya-sanhitá.]

[3] *Sphuṭavikshepa* and *Sphuṭadhruvaka*; which will be explained further on. [Cf. Burgess, *Transl.* p. 214.]

RKE
14
Chitr
washt
A pea
lamp
40
180°
2° S.
183°
2° S.
183°
° 45'
183°
2° S.
183°
° 52
Vi ni Spi

mentators,[1] remarking on this passage, describe the manner of making the observation: and the same description occurs, with little variation, in commentaries on the Śiromaṇi.[2] They direct a spherical instrument (Golayantra) to be constructed, according to instructions contained in a subsequent part of the text. This, as will be hereafter shown, is precisely an armillary sphere. An additional circle, graduated for degrees and minutes, is directed to be suspended on the pins of the axis as pivots. [325] It is named Vedhavalaya, or intersecting circle, and appears to be a circle of declination. After noticing this addition to the instrument, the instructions proceed to the rectifying of the Golayantra, or armillary sphere, which is to be placed, so that the axis shall point to the pole, and the horizon be true by a water-level.

The instrument being thus placed, the observer is instructed to look at the star Revatí through a sight fitted to an orifice at the centre of the sphere; and having found the star, to adjust by it the end of the sign Pisces on the ecliptic. The observer is then to look, through the sight, at the *yoga* star of Aświní, or at some other proposed object; and to bring the movable circle of declination over it. The distance in degrees, from the intersection of this circle and ecliptic, to the end of Mína or Pisces, is its longitude (*dhruvaka*) in degrees; and the number of degrees on the movable circle of declination, from the same intersection to the place of the star, is its latitude (*vikshepa*) north or south.[3]

The commentators[4] further remark, that 'the latitude, so found, is (*sphuṭa*) apparent, being the place intercepted be-

[1] Ranganátha and Bhúdhara.

[2] In the Vásaná-bháshya, and in the Maríchi.

[3] Father Pétau, and, after him, Bailly, for reasons stated by them (Uranol. Dissert. 2. 2. Ast. Anc. p. 428), are of opinion, that the ancient astronomers referred stars to the equator; and that Eudoxus and Hipparchus must be so understood, when speaking of the longitudes of stars. Perhaps the Greek astronomers, like the Hindus, reckoned longitudes upon the ecliptic intersected by circles of declination, in the manner which has been here explained.

[4] Bhúdhara is the most explicit on this point.

tween the star and the ecliptic, on a circle passing through the poles; but the true latitude (*asphuṭa*) is found on a circle hung upon the poles of the celestial sphere, as directed in another place.' The longitude, found as above directed, is, in like manner, the space intercepted between the origin of the ecliptic and a circle of declination passing [326] through the star: differing, consequently, from the true longitude. The same commentators add, that the longitudes and latitudes, exhibited in the text, are of the description thus explained: and those, which are stated in the Súrya-siddhánta, are expressly affirmed to be adapted to the time when the equinox did not differ from the origin of the ecliptic in the beginning of Mesha.

It is obvious that, if the commentators have rightly understood the text of their authors, the latitudes and longitudes there given require correction. It will indeed appear, in the progress of this inquiry, that the positions of stars distant from the ecliptic, as there given, do not exactly correspond with the true latitudes and longitudes of the stars supposed to be intended: and the disagreement may be accounted for, by the circumstance of the observations having been made in the manner above described.

Another mode of observation is taught in the Siddhánta-sundara, cited and expounded by the author of the Siddhánta-sárvabhauma. 'A tube, adapted to the summit of a gnomon, is directed towards the star on the meridian: and the line of the tube, pointed to the star, is prolonged by a thread to the ground. The line from the summit of the gnomon to the base is the hypotenuse; the height of the gnomon is the perpendicular; and its distance from the extremity of the thread is the base of the triangle. Therefore, as the hypotenuse is to its base, so is the radius to a base, from which the sine of the angle, and consequently the angle itself, are known. If it exceed the latitude, the declination is south; or, if the contrary, it is north. The right ascension of the star is ascer-

tained by calculation from the hour of the night, and from the right ascension of the sun for that time. The declination of the corresponding point of the ecliptic being found, the sum or difference [327] of the declinations, according as they are of the same or of different denominations, is the distance of the star from the ecliptic. The longitude of the same point is computed; and from these elements, with the actual precession of the equinox, may be calculated the true longitude of the star; as also its latitude on a circle passing through the poles of the ecliptic.'

Such, if I have rightly comprehended the meaning in a single and not very accurate copy of the text, is the purport of the directions given in the Siddhánta-sundara and sárva-bhauma: the only works in which the true latitudes and longitudes of the stars are attempted to be given. All the rest exhibit the longitude of the star's circle of declination, and its distance from the ecliptic measured on that circle.

I suppose the original observations, of which the result is copied from Brahmagupta and the Súrya-siddhánta, with little variation, by successive authors, to have been made about the time, when the vernal equinox was near the first degree of Mesha.[1] The pole then was nearly seventeen degrees and a quarter from its present position, and stood a little beyond the star near the ear of the Cameleopard. On this supposition it will be accordingly found, that the assigned places of the *nakshatras* are easily reconcilable to the positions of stars likely to be meant.

I shall here remark, that the notion of a polar star, common to the Indian and Grecian celestial spheres, implies considerable antiquity. It cannot have been taken from our present pole-star (*a* Ursæ minoris), which, as Mons. Bailly has

[1] Brahmagupta wrote soon after that period; and the Súrya-siddhánta is probably a work of nearly the same age. Mr. Bentley considers it as more modern (As. Res., vol. vi.): it certainly cannot be more ancient; for the equinox must have past the beginning of Mesha, or have been near it, when that work was composed.

observed,[1] was remote from the pole, when [328] Eudoxus described the sphere; at which time, according to the quotation of Hipparchus, there was a star situated at the pole of the world.[2] Bailly conjectures, as the intermediate stars of the sixth magnitude are too small to have designated the pole, that *κ* Draconis was the star meant by Eudoxus, which had been at its greatest approximation to the pole, little more than four degrees from it, about 1326 years before Christ. It must have been distant, between seven and eight degrees of a great circle, when Eudoxus wrote. Possibly the great star in the Dragon (*α* Draconis), which is situated very near to the circle described by the north pole round the pole of the ecliptic, had been previously designated as the polar star. It was within one degree of the north pole about 2836 years before Christ. As we know, that the idea could not be taken from the star in the tail of Ursa minor, we are forced to choose between Bailly's conjecture or the supposition of a still greater antiquity. I should, therefore, be inclined to extend to the Indian sphere, his conjecture respecting that of Eudoxus.

I shall now proceed to compare the *nakshatras* with the *manzils* of the moon, or lunar mansions.

I. Aświní, now the first *nakshatra*, but anciently the last but one, probably obtained its present situation at the head of the Indian asterisms, when the beginning of the zodiac was referred to the first degree of Mesha, or the Ram, on the Hindu sphere. As measuring a portion of the zodiac, it occupies the first 13° 20′ of Mesha: and its beginning follows immediately after the principal star in the last *nakshatra* (Revatí), reckoned, by some exactly, by others nearly, opposite to the very conspicuous one, which forms the fourteenth asterism. Considered as a constellation, [329] Aświní comprises three stars figured as a horse's head; and the principal, which is also the northern one, is stated by all ancient authorities, in 10° N. and 8° E. from the beginning of Mesha.

[1] *Astronomie Ancienne*, p. 511.
[2] Hipparchus, *Comment. on Aratus*, lib. i. p. 179.

The first *manzil*, or lunar mansion, according to the Arabs, is entitled Sharatán, (by the Persians corruptly called, as in the oblique case, Sharatain), and comprises two stars of the third magnitude on the head of Aries, in lat. 6° 36′ and 7° 51′ N., and long. 26° 13′ and 27° 7′.[1] With the addition of a third, also in the head of the Ram, the asterism is denominated Ashrát. The bright star of the second or third magnitude, which is out of the figure of the Ram according to Ulugh-beg, but on the nose according to Hipparchus cited by this author from Ptolemy, is determined Nátih: it is placed in lat. 9° 30′ N. and long. 1ˢ 0° 43′, and is apparently the same with the principal star in the Indian asterism; for Muhammad of Tízín, in his table of declination and right ascension, expressly terms it the first star of the Sharatain.[2]

Many paṇḍits, consulted by me, have concurred in pointing to the three bright stars in the head of Aries (α β and γ) for the Indian constellation Aświní. The first star of Aries (α) was also shown to Dr. Hunter, at Ujjayiní, for the principal one in this asterism; and Mr. Davis[3] states the other two, as those which were pointed out to him by a skilful native astronomer, for the stars that distinguish Aświní. The same three stars, but with the addition of three others, were indicated to Le Gentil, for this constellation.[4] I entertain, therefore, no doubt that Sir [330] William Jones[5] was right in placing the three stars of Aświní in, and near, the head of the Ram; and it is evident, that the first *nakshatra* of the Hindus is here rightly determined, in exact conformity with the first lunar mansion of the Arabs; although the longitude of α Arietis exceed, by half a degree, that which is deduced, for the end of Aświní, from the supposed situation of the Virgin's spike opposite to the beginning of this *nakshatra;*

[1] Hyde's Ulugh-beg, p. 58.
[2] Hyde's *Com. on Ulugh-beg's Tables*, p. 97.
[3] As. Res., vol. ii. p. 226.
[4] Mém. Acad. Scien., 1772, P. ii., p. 209.
[5] As. Res., vol. ii. p. 298.

and although its circle of declination be 13° instead of 8° from the principal star in Revatí.

II. Bharaṇí, the second Indian asterism, comprises three stars figured by the Yoní or *pudendum muliebre:* and all ancient authorities concur in placing the principal and southern star of this *nakshatra* in 12° N. The second *manzil*, entitled Butain, is placed by Ulugh-beg[1] in lat. 1° 12′ and 3° 12′; and this cannot possibly be reconciled with the Hindu constellation. But Muhammad of Tízín[2] assigns to the bright star of Butain a declination of 23° N. exceeding by nearly 2° the declination allotted by him to Nátih, or his first star in Sharatain. This agrees with the difference between the principal stars of Aświní and Bharaṇí; and it may be inferred, that some among the Muhammadan astronomers have concurred with the Hindus, in referring the second constellation to stars that form Musca. There were no good grounds for supposing Bharaṇí to correspond with three stars on the tail of the Ram;[3] and I have no doubt, that the stars, which compose this *nakshatra*, have been rightly indicated to me, as three in Musca, forming a triangle almost equilateral: their brightness, and their equal distance from the first and third asterisms, corroborate this opinion, which will be confirmed by showing, as will be done in the progress of [331] this comparison, that the *nakshatras* are not restricted to the limits of the zodiac.

III. Kṛittiká, now the third, but formerly the first, *nakshatra*, consists of six stars figured as a knife or razor, and the principal and southern star is placed in 4½° or 5° N. and in 65 sixths of degrees (or 10° 50′) from its own commencement, according to the Súrya-siddhánta, or 37° 28′ to 38° from the beginning of Mesha, according to the Siddhánta-śiromaṇi, and Graha-lághava, respectively. This longitude of the circle of declination corresponds nearly with that of the

[1] Hyde, p. 61.
[2] See Hyde's *Commentary*, p. 97.
[3] As. Res., vol. ii. p. 298.

bright star in the Pleiades, which is 40° of longitude distant from the principal star of Revatí.

The stars indicated by Ulugh-beg for Thurayyá, also correspond exactly with the Pleiades; and these were pointed out to the Jesuit missionaries,[1] as they have since been to every other inquirer, for the third *nakshatra*. If any doubt existed, Mythology might assist in determining the question; for the Kṛittikás are six nymphs, who nursed Skanda, the god of war, named from these, his foster-mothers, Kártikeya or Shaṇmátura.

IV. We retain on our celestial globes the Arabic name of the fourth lunar mansion Dabarán (or with the article, Aldabarán): applied by us, however, exclusively to the bright star called the Bull's-eye; and which is unquestionably the same with the principal and eastern star of Rohiṇí, placed in 4½° or 5° S. and 49½° E. by the Hindu writers on Astronomy. This *nakshatra*, figured as a wheeled carriage, comprises five stars, out of the seven which the Greeks named the Hyades. The Arabs, however, like the Hindus, reckon five stars only in the asterism; and Sir William Jones rightly supposed them to be in the head and neck of the Bull; they probably are α ρ γ δ ε Tauri, agreeably to Mons. Bailly's conjecture.[2]

[332] Hindu astronomers define a point in this constellation, of some importance in their fanciful astrology. According to the Súrya-siddhánta, when a planet is in the 7th degree of Vṛisha (Taurus), and has more than two degrees of south latitude, or, as commentators expound the passage, 2° 40′; the planet is said to cut the cart of Rohiṇí. This is denominated *śakaṭabheda*, or the section of the wain. Lalla and the Graha-lághava give nearly the same definition; and it is added, in the work last mentioned, that, when Mars, Saturn, and the Moon, are in that position (which occurs, in regard to the moon, when the node is eight *nakshatras* distant from

[1] Costard's *Hist. of Astr.*, p. 51. Bailly's *Astr. Ind.*, p. 134.
[2] *Astr. Ind.*, p. 129.

Punarvasu, and might happen in regard to the rest during another *yuga*), the world is involved in great calamity. Accordingly, the *puráṇas* contain a legendary story of Daśaratha's dissuading Saturn from so traversing the constellation Rohiṇí.

V. Mṛigaśiras, the fifth *nakshatra*, represented by an antelope's head, contains three stars: the same which constitute the fifth lunar mansion Hak'ah; for the distance of 10° S. assigned to the northern star of this *nakshatra* will agree with no other but one of the three in the head of Orion. The difference of longitude (24° to 25½°) from Kṛittiká corresponds with sufficient exactness; and so does the longitude of its circle of declination (62° to 63°) from the end of Revatí; since the true longitude of λ Orionis from the principal star in Revatí (ζ Piscium) is 63½°. It was a mistake to suppose this asterism to comprise stars in the feet of Gemini, or in the Galaxy.[1]

VI. Árdrá, the sixth *nakshatra*, consists of a single bright star, described as a gem, and placed in 9° S. by one authority, but in 11° by others, and at the distance of 4⅛° to 4° in longitude from the last asterism. This indicates the star in the shoulder of Orion (*a* Orionis); not, as [333] was conjectured by Sir William Jones, the star in the knee of Pollux.[2]

The sixth lunar mansion is named by the Arabs, Han'ah; and comprises two stars in the feet of the second Twin, according to Ulugh-beg, though others make it to be his shoulder.[3] Muhammad of Tízín allots five stars to this constellation: and the Kámús, among various meanings of Han'ah, says, that it is a name for five stars in the left arm of Orion; remarking, also, that the lunar mansion is named Taháyí, comprising three stars called Tahyát. Either way, however, the Indian and Arabian asterisms appear in this instance irreconcilable.

VII. The seventh *nakshatra*, entitled Punarvasu, and re-

[1] As. Res., vol. ii. p. 298.

[2] As. Res., vol. ii. p. 298.

[3] Hyde, Com. pp. 7 and 44.

presented by a house, or, according to a Sanskrit work cited by Sir William Jones,[1] a bow, is stated by astronomers as including four stars, among which the principal and eastern one is 30° or 32° from the fifth asterism; but placed by all authorities in 6° N. This agrees with (β Geminorum) one of the two stars in the heads of the Twins, which together constitute the seventh lunar mansion Zirá', according to Muhammad of Túš and Muhammad of Tízín and other Arabian authorities.[2]

It appears from a rule of Sanskrit grammar,[3] that Punarvasu, as a name for a constellation, is properly dual, implying, as it may be supposed, two stars. On this ground, a conjecture may be raised, that Punarvasu originally comprised two stars, though four are now assigned to it. Accordingly, that number is retained in the Śákalya-sanhitá.

It may be further observed, that the seventh lunar [334] mansion of the Arabs is named Zirá' ul asad according to Jauharí and others cited by Hyde; [4] and that the Kámús makes this term to be the name of eight stars in the form of a bow.

Upon the whole, the agreement of the Indian and Arabian constellations is here apparent, notwithstanding a variation in the number of the stars; and I conclude, that Punarvasu comprises, conformably with Sir William Jones's supposition,[5] stars in the heads of the twins; *viz.* α, β, Geminorum; and which were indicated to Dr. Hunter by a Hindu astronomer at Ujjayiní: to which, perhaps, θ and τ may be added to complete the number of four.

VIII. Pushya, the eighth asterism, is described as an arrow; and consists of three stars, the chief of which, being also the middlemost, has no latitude, and is 12° or 13° distant from the seventh asterism, being placed by Hindu astronomers in 106° of longitude. This is evidently δ Cancri; and does not differ widely from the eighth lunar mansion Nathrah, which,

[1] As. Res., vol. ii. p. 295.
[2] Hyde on Ulugh-beg, p. 43.
[3] Páṇini, I. ii. 63.
[4] Com. on Ulugh-beg, p. 44.
[5] As. Res., vol. ii. p. 299.

according to Ulugh-beg and others,[1] consists of two stars, including the nebula of Cancer. The Indian constellation comprises two other stars, besides δ Cancri, which are perhaps γ and β of the same constellation; and Sir William Jones's conjecture, that it consists of stars in the body and claws of Cancer, was not far from the truth.

IX. The ninth asterism, Áśleshá, contains five stars figured as a potter's wheel, and of which the principal or eastern one is placed in 7° S., and according to different tables, 107°, 108°, or 109°, E. This appears to be intended for the bright star in the southern claw of Cancer (α Cancri), [335] and cannot be reconciled with the lunar mansion Tarf or Tarfah, which comprises two stars[2] near the lion's eye; the northernmost being placed by Muhammad of Tízín in 24° of N. declination.[3] The Jesuit missionaries, if rightly quoted by Costard,[4] made Áśleshá correspond with the bright stars in the heads of Castor and Pollux, together with Procyon. This is evidently erroneous. Sir William Jones's supposition that Áśleshá might answer to the face and mane of Leo, nearly concurs with the Arabian determination of this lunar mansion, but disagrees with the place assigned to the stars by Hindu astronomers. Bailly committed the same mistake, when he affirmed, that Áśleshá is the lion's head.[5]

X. The tenth asterism, Maghá, contains, like the last, five stars; but which are figured as a house. The principal or southern one has no latitude; and, according to all authorities, has 129° longitude. This is evidently Regulus (α Leonis): which is exactly $129\frac{2}{3}$° distant from the last star in Revatí.

According to the Jesuits cited by Costard, Maghá answers to the lion's mane and heart; and the tenth lunar mansion of the Arabians, Jabhah, comprises three (some say four) stars,

[1] Hyde's Com., p. 46.
[2] Hyde's Com., p. 8.
[3] Hyde's Com., p. 101.
[4] *Hist. of Astr.*, p. 51.
[5] *Astr. Ind.* p. 328.

nearly in the longitude of the lion's heart.[1] In this instance, therefore, the Indian and Arabian divisions of the zodiac coincide: and it is owing to an oversight that Sir William Jones states the *nakshatra* as composed of stars in the lion's leg and haunch. It appears to consist of α γ ζ η and ν Leonis.

XI. Two stars, constituting the eleventh *nakshatra*, or preceding Phálguní, which is represented by a couch or [336] bedstead, are determined by the place of the chief star (the northernmost according to the Súrya-siddhánta) in 12° N. and 144° E. or, according to Brahmagupta, the Śiromaṇi and the Graha-lághava, 147° or 148° E. They are probably δ and θ Leonis: the same which form the lunar mansion Zubrah or Khartán.[2]

It may be conjectured, that Brahmagupta and Bháskara selected the southern for the principal star; while the Súrya-siddhánta took the northern: hence the latitude, stated by those several Hindu authorities, is the mean between both stars; and the difference of longitude, compared to the preceding and subsequent asterisms, may be exactly reconciled upon this supposition.

XII. Two other stars, constituting the twelfth *nakshatra*, or following Phálguní, which is likewise figured as a bed, are ascertained by the place of one of them (the northernmost) in 13° N. and 155° E. This indicates β Leonis; the same which singly constitutes the Arabian lunar mansion Sarfah,[3] though Muhammad of Tízín seems to hint that it consists of more than one star.[4] By an error regarding the origin of the ecliptic on the Indian sphere, Sir William Jones refers to the preceding *nakshatra* the principal star of this asterism.

XIII. Hasta, the thirteenth *nakshatra*, has the name and figure of a hand; and is suitably made to contain five stars. The principal one, towards the west, next to the north-

[1] Hyde's Ulugh-beg, p. 74, and Com., p. 46.
[2] Hyde's Ulugh-beg, p. 76, and Com., p. 47.
[3] Hyde's Ulugh-beg, p. 78, and Com., p. 47.
[4] Hyde, p. 102.

western star, is placed according to all authorities in 11° S. and 170° E. This can only belong to the constellation Corvus: and accordingly five stars in that constellation (α β γ δ ϵ Corvi) have been pointed out to me by Hindu astronomers for this *nakshatra.*

[337] 'Awwá, the thirteenth lunar mansion of the Arabs, is described as containing the same number of stars, situated under Virgo, and so disposed as to resemble the letter Alif. They are placed by Ulugh-beg in the wing.[1]

In this instance the Indian and Arabian divisions of the zodiac have nothing in common but the number of stars and their agreement of longitude. It appears, however, from a passage cited from Súfí by Hyde,[2] that the Arabs have also considered the constellation of Corvus as a mansion of the moon.

XIV. The fourteenth *nakshatra*, figured as a pearl, is a single star named Chitrá. It is placed by the Súrya-siddhánta in 2° S. and 180° E., and by Brahmagupta, the S'iromaṇi and Graha-lághava, in 1¾° or 2° S. and 183° E. This agrees with the Virgin's spike (α Virginis); and Hindu astronomers have always pointed out that star for Chitrá. The same star constitutes the fourteenth lunar mansion of the Arabs, named from it Simák ul a'zil. Le Gentil's conjecture,[3] that the fourteenth *nakshatra* comprises the two stars δ and ϵ Virginis, was entirely erroneous. And Mons. Bailly was equally incorrect in placing θ Virginis in the middle of this asterism.[4]

XV. Another single star constitutes the fifteenth *nakshatra*, Swátí, represented by a coral bead. The Súrya-siddhánta, Brahmagupta, the Śiromaṇi and Graha-lághava, concur in placing it in 37° N. They differ one degree in the longitude of its circle of declination; three of these authorities making it 199°, and the other 198°.

The only conspicuous star, nearly in the situation thus

[1] Hyde's Ulugh-beg, p. 80.
[2] Com., p. 82.
[3] Bailly, *Astr. Ind.*, p. 227.
[4] *Astr. Ind.*, p. 227.

assigned to Swátí (and the Indian astronomers would hardly travel so far from the zodiac to seek an obscure [338] star), is Arcturus, 33° N. of the ecliptic in the circle of declination, and 198° E. from the principal star of Revatí. I am therefore disposed to believe, that Swátí has been rightly indicated to me by a native astronomer who pointed out Arcturus for this *nakshatra*. The longitude, stated by Muníśwara (*viz.* 1⅓° less than Chitrá), indicates the same star: but, if greater reliance be placed on his latitudes, the star intended may be ε Bootis. At all events, Mons. Bailly mistook, when he asserted, on the authority of Le Gentil, that the fifteenth *nakshatra* is marked by α Virginis; and that this star is situated at the beginning of the *nakshatra*.[1]

The Indian asterism totally disagrees with the lunar mansion Ghafr, consisting of three stars in the Virgin's foot, according to Ulugh-beg,[2] but in, or near, the balance, according to others.

XVI. Viśákhá, the sixteenth *nakshatra*, consists of four stars described as a festoon. Authorities differ little as to the situation of the principal and northernmost star: placing it in 1°, 1° 20′, or 1° 30′ S., and in 212°, 212° 5′ or 213° E. The latitude seems to indicate the bright star in the southern Scale (α Libræ), though the longitude disagree: for this suggests a remote star (possibly κ Libræ). I apprehend the first to be nearest the truth; and hence conclude the four stars to be α ν ι Libræ and γ Scorpii.

The sixteenth lunar mansion, named Zubanah or Zubániyah,[3] is, according to Muhammad of Tízín,[4] the bright star in the northern Scale (β Libræ), which Sir William Jones supposed to be the fifteenth *nakshatra*.

Father Souciet, by whom Corona Borealis is stated [339] for the asterism Viśákhá, is censured by Sir William Jones, under an impression, that all the *nakshatras* must be sought

[1] *Astr. Ind.*, p. 139 and 227.

[2] Hyde, p. 82, and Com., p. 50.

[3] [*Zubána'* or *Zubániyán*?]

[4] Hyde, Com., p. 104.

within the zodiac. The information, received by Father Souciet, does appear to have been erroneous; but the same mistake was committed by a native astronomer, who showed to me the same constellation for Viśákhá; and the *nakshatras* are certainly not restricted to the neighbourhood of the ecliptic.

XVII. Four stars (or, according to a different reading, three), described as a row of oblations, that is, in a right line, constitute the seventeenth *nakshatra* named Anurádhá. Here also authorities differ little as to the situation of the chief and middlemost star; which is placed in 3°, or 2°, or 1° 45′ S., and in 224° or 224° 5′ E. This must intend the star near the head of the Scorpion (δ Scorpionis): and the asterism probably comprises β δ π and ρ Scorpionis.

The seventeenth lunar mansion of the Arabs, called Iklíl or Iklílu'ljabhah, contains four (some say three, and others six[1]) stars lying in a straight line. Those assigned by Ulugh-beg[2] for this mansion are β δ ν π Scorpionis.

Here the Indian and Arabian divisions appear to concur exactly; and Sir William Jones,[3] as well as the missionaries cited by Costard,[4] have apparently understood the same stars; though the latter extend the *nakshatra* to the constellation Serpentarius.

XVIII. Jyeshṭha, the eighteenth *nakshatra*, comprises three stars figured as a ring. In regard to this, also, authorities are nearly agreed in the position of the principal and middle-most star, placed in 4°, 3½°, or 3° S., and in 229°, 229° 5′, or 230° E. This position clearly indicates Antares or the Scorpion's heart (α Scorpionis); which is [340] also the eighteenth lunar mansion, named Kalb or Kalbul'akrab. The three stars of the Indian asterism may be α σ and τ Scorpionis.

XIX. The nineteenth asterism, Múla, represented by a lion's tail, contains eleven stars, of which the characteristic one, the easternmost, is placed in 9°, 8½°, or 8° S., and in 241°

[1] Hyde, Com., p. 51.
[2] Hyde, p. 87.
[3] As. Res., ii. p. 299.
[4] *Hist. Astr.*, p 51.

or 242° E. Although the latitude of υ Scorpionis be five degrees too great, there seems little doubt that either that or the star east of it, marked ν, must be intended; and this determination agrees with the eighteenth lunar mansion of the Arabs called Shaulah, consisting of two stars near the Scorpion's sting. The Hindu asterism probably includes all the stars placed by us in the Scorpion's tail, *viz.* ε μ ζ η θ ι κ λ υ and ν Scorpionis.

XX. The twentieth *nakshatra*, entitled preceding Áshádha, figured as an elephant's tooth, or as a couch, consists of two stars, of which the most northern one is placed in 5½°, 5⅓°, or 5° S., and 254° or 255° E. This suits with δ Sagittarii, which is also one of the stars of the twentieth lunar mansion called Na'áim. It consists of four, or, according to some authorities, of eight stars. The Indian asterism seemingly comprises δ and ε Sagittarii.

XXI. Two stars constitute the twenty-first asterism, named the subsequent Áshádha, which is represented by a couch or by an elephant's tooth. The principal star, which also is the most northerly one, is placed in 5° S., and 260°, or 261° E. This agrees with a star in the body of Sagittarius (τ Sagittarii), and the other star is perhaps the one marked ζ.

The twenty-first lunar mansion of the Arabians, named Baldah, comprises six stars, two of which are placed by Muhammad of Tízín in declination 21° and 16°. One of these must be a star in the head of Sagittarius. Some authors, on the contrary, describe the lunar mansion as [341] destitute of stars.[1] At all events, the Hindu and Arabian divisions appear, in this instance, to be but imperfectly reconcilable.

XXII. Three stars, figured as a triangle, or as the nut of the floating Trapa, form the twenty-second asterism, named Abhijit; which, in the modern Indian astronomy, does not occupy an equal portion of the ecliptic with the other *nak-*

[1] Hyde, Com. on Ulugh-beg, p. 9.

shatras, but is carved out of the contiguous divisions. Its place (meaning that of its brightest star) is very remote from the zodiac; being in 60° or 62° N. The longitude of its circle of declination, according to different authorities, is 265°, 266° 40′, or 268°. Probably the bright star in the Lyre is meant. It was shown to Dr. Hunter, at Ujjayiní, for the chief star in Abhijit; and the same was pointed out to me for the asterism, by a Hindu astronomer at this place.

The Arabian lunar mansion Zábih consists of two stars (some reckon four [1]) in the horns of Capricorn, totally disagreeing with the Indian *nakshatra.*

XXIII. Śravaṇá, the twenty-third *nakshatra*, represented by three footsteps, contains three stars, of which one, the middlemost, is by all authorities placed in 30° N., but they differ as to its longitude; the Súrya-siddhánta placing it in 280°; Brahmagupta and the S′iromaṇi in 278°; and the Graha-lághava in 275°. The assigned latitude indicates the bright star in the Eagle, whence the three may be inferred to be α β and γ Aquilæ.

The twenty-third mansion of the moon, called by the Arabs Bulaʿ, consists of two stars in the left hand of Aquarius. Consequently the Arabian and Hindu divisions are here at variance.

[342] XXIV. Dhanishṭhá, the twenty-fourth asterism, is represented by a drum or tabor. It comprises four stars, one of which (the westernmost) is placed in 36° N., and according to the Súrya-siddhánta, Brahmagupta and the Śiromaṇi, in 290° E., though the Graha-lághava state 286° only. This longitude of the circle of declination, and the distance of the star on it from the ecliptic, indicate the Dolphin; and the four stars probably are α β γ and δ Delphini. The same constellation is mentioned by the Jesuit missionaries as corresponding to Dhanishṭhá; [2] and there can be little doubt that the ascertainment is correct. The longitude stated by Muníśwara

[1] Ulugh-beg, p. 94, and Hyde's Com., p. 54.
[2] Costard, p. 81.

(*viz.* 294° 12′) supports the conclusion, though his latitude (26° 25′) be too small. To determine accurately the position of this *nakshatra* is important, as the solstitial colure, according to the ancient astronomers, passed through the extremity of it, and through the middle of Áśleshá.

The twenty-fourth mansion, called by the Arabs Sa'úd, comprises two stars in Aquarius (β and ξ Aquarii); totally disagreeing with the Hindu division.

XXV. Śatabhishá, the twenty-fifth *nakshatra*, is a cluster of a hundred stars figured by a circle. The principal one, or brightest, has no latitude; or only a third, or at the utmost half, a degree of south latitude; and all the tables concur in placing it in long. 320°. This will suit best with λ Aquarii. These hundred stars may be sought in the stream from the Jar, where Sir William Jones places the *nakshatra;* and in the right leg of Aquarius.

Akhbiyah, the twenty-fifth lunar mansion, is stated to consist of three stars only, which seem to be the three in the wrist of the right hand of Aquarius.[1] However, it appears from Ulugh-beg's tables, as well as from Mu[343]hammad of Tízín's, that four stars are assigned to this mansion.[2]

The Hindu and Arabian asterisms differ here less widely than in the instances lately noticed: and a passage, cited by Hyde from Fírúzábádí, even intimates the circular figure of the constellation.[3]

XXVI. The twenty-sixth of the Indian asterisms, called the preceding Bhádrapada, consists of two stars represented by a couch or bed, or else by a double-headed figure; one of which is placed by Hindu astronomers in 24° N., and 325° or 326° E. The only conspicuous star, nearly in that situation, is the bright star in Pegasus (α Pegasi); and the other may be the nearest considerable star in the same constellation (ζ Pegasi). I should have considered β Pegasi to be the

[1] Hyde's Com., p. 55.
[2] Hyde, p. 99, and Com., p. 95.
[3] Com., p. 10.

second star of this *nakshatra*, were not its *yoga* or chief star expressly said to be the most northerly. Mukaddam, the twenty-sixth lunar mansion, consists of the two brightest stars in Pegasus (α and β)[1]; and thus the two divisions of the zodiac nearly concur.

XXVII. Two other stars constitute the twenty-seventh lunar mansion named the subsequent Bhádrapada. They are figured as a twin, or person with a double face, or else as a couch. The position of one of them (the most northerly) is stated in 26° or 27° N., and 337° E. I suppose the bright star in the head of Andromeda to be meant; and the other star to be the one in the extremity of the wing of Pegasus (γ Pegasi). This agrees exactly with the twenty-seventh lunar mansion of the Arabians, called Muakhkhar. For Ulugh-beg assigns those stars to it.[2]

XXVIII. The last of the twenty-eight asterisms is named Revatí, and comprises thirty-two stars figured as [344] a tabor. All authorities agree that the principal star, which should be the southernmost, has no latitude, and two of them assert no longitude; but some make it ten minutes short of the origin of the ecliptic, *viz.* 359° 50′. This clearly marks the star on the ecliptic in the string of the Fishes (ζ Piscium); and the ascertainment of it is important in regard to the adjustment of the Hindu sphere.

The Arabic name of the 28th mansion, Rishá, signifying a cord, seems to indicate a star nearly in the same position. But the constellation, as described by Jauharí cited by Golius, consists of a multitude of stars in the shape of a fish, and termed Batnu'lhút; in the navel of which is the lunar mansion: and Muhammad of Tízín, with some others, also makes this lunar mansion to be the same with Batnu'lhút, which appears, however, to be the bright star in the girdle of Andromeda (β Andromedæ); though others describe it as

[1] Hyde's Ulugh-beg, p. 53, and Com., p. 34.
[2] Hyde, p. 53, and Com., pp. 34 and 35.

the northern Fish, extending, however, to the horns of the Ram.[1] The lunar mansion and Indian asterism are, therefore, not reconcilable in this last instance.

The result of the comparison shows, I hope satisfactorily, that the Indian asterisms, which mark the divisions of the ecliptic, generally consist of nearly the same stars, which constitute the lunar mansions of the Arabians: but, in a few instances, they essentially differ. The Hindus have likewise adopted the division of the ecliptic and zodiac into twelve signs or constellations, agreeing in figure and designation with those of the Greeks; and differing merely in the place of the constellations, which are carried on the Indian sphere a few degrees further west than on the Grecian. That the Hindus took the hint of this mode of dividing the ecliptic from the Greeks, is not perhaps altogether improbable; but, if such be the origin of it, they [345] have not implicitly received the arrangement suggested to them, but have reconciled and adapted it to their own ancient distribution of the ecliptic into twenty-seven parts.[2]

In like manner, they may have either received or given the hint of an armillary sphere as an instrument for astronomical observation: but certainly they have not copied the instrument which was described by Ptolemy, for the construction differs considerably.

In the Arabic epitome of the Almijast entitled Tahríru'l-mijastí,[3] the armillary sphere (*Zát ul halk*) is thus described. "Two equal circles are placed at right angles; the one representing the ecliptic, the other the solstitial colure. Two pins pass through the poles of the ecliptic; and two other pins

[1] Hyde's Com., pp. 10, 35, and 96.

[2] According to the longitude of the three brightest stars of Aries, as stated by Ptolemy, *viz.* 10° 40′, 7° 40′, and 6° 40′, (I quote from an Arabic epitome of the Almijast), the origin of the ecliptic, in the Greek book which is most likely to have become known in India, is 6° 20′ from the star which the Hindus have selected to mark the commencement of the ecliptic.

[3] By the celebrated Násiruddín Túsí; from the Arabic version of Ishák ben Honain, which was revised by Thábit.

are placed on the poles of the equator. On the two first pins are suspended a couple of circles, moving the one within, the other without, the first mentioned circles, and representing two secondaries of the ecliptic. On the two other pins a circle is placed, which encompasses the whole instrument, and within which the different circles turn; it represents the meridian. Within the inner secondary of the ecliptic a circle is fitted to it, in the same plane, and turning in it. This is adapted to measure latitudes. To this internal circle, two apertures, or sights, opposite to each other, and without its plane, are adapted, like the sights of an instrument for altitudes. The armillary sphere is complete when consisting of these six circles. The ecliptic and secondaries are to be gra[346]duated as minutely as may be practicable. It is best to place both secondaries, as by some directed, within the ecliptic (instead of placing one of them without it), that the complete revolution of the outer secondary may not be obstructed by the pins at the poles of the equator. The meridian, likewise, should be doubled, or made to consist of two circles; the external one graduated, and the internal one moving within it. Thus the pole may be adjusted at its proper elevation above the horizon of any place. The instrument so constructed consists of seven circles.

"It is remarked, that when the circle representing the meridian is placed in the plane of the true meridian, so that it cuts the plane of the horizon at right angles, and one of the poles of the equator is elevated above the horizon conformably with the latitude of the place; then the motions of all the circles round the poles represent the motions of the universe.

"After rectifying the meridian, if it be wished to observe the sun and moon together, the outer secondary of the ecliptic must be made to intersect the ecliptic at the sun's place for that time: and the solstitial colure must be moved until the place of intersection be opposite to the sun. Both circles are thus adjusted to their true places; or if any other object but

the sun be observed, the colure is turned, until the object be seen in its proper place, on that secondary referred to the ecliptic: the circle representing the ecliptic being at the same time in the plane of the true ecliptic and in its proper situation. Afterwards, the inner secondary is turned towards the moon (or to any star intended to be observed), and the smaller circle within it, bearing the two sights, is turned, until the moon be seen in the line of the apertures. The intersection of the [347] secondary circle and ecliptic is the place of the moon in longitude; and the arc of the secondary, between the aperture and the ecliptic, is the latitude of the moon on either side (north or south)."

The same instrument, as described by Montucla from the text of Ptolemy (l. 3, c. 2),[1] consists of six circles: first, a large circle representing the meridian; next, four circles united together, representing the equator, ecliptic and two colures, and turning within the first circle on the poles of the equator; lastly, a circle turning on the poles of the ecliptic, furnished with sights and nearly touching, on its concave side, the circumference of the ecliptic.

The armillary sphere, described by the Arabian epitomiser, differs, therefore, from Ptolemy's, in omitting the equator and equinoctial colure, and adding an inner secondary of the ecliptic, which, as well as the meridian, is doubled.

According to Lalande, the astrolabe of Ptolemy, from which Tycho Brahe derived his equatorial armillary, consisted only of four circles: two placed at right angles to represent the ecliptic and solstitial colure; a third turning on the poles of the ecliptic and serving to mark longitudes; and a fourth, within the other three, furnished with sights to observe celestial objects and measure their latitudes and longitudes.[2]

Whether the ancient Greeks had any more complicated

[1] *Hist. des Mathém.*, i. p. 301.
[2] Lalande, *Astron.*, i. 13. (§ 2279).

instrument formed on similar principles, and applicable to astronomical observations, is perhaps uncertain. We have no detailed description of the instrument which Archimedes is said to have devised to represent the phenomena and motions of the heavenly bodies; nor any sufficient [348] hint of its construction;[1] nor does Cicero's account of the sphere exhibited by Posidonius[2] suggest a distinct notion of its structure.

Among the Arabs, no addition is at present known to have been made to the armillary sphere, between the period when the Almijast was translated,[3] and the time of Alházin, who wrote a treatise of optics, in which a more complicated instrument than that of Ptolemy is described. Alházin's armillary sphere is stated to have been the prototype of Tycho Brahe's;[4] but neither the [349] original treatise, nor the Latin translation of it, are here procurable; and I am therefore unable to ascertain whether the sphere, mentioned by the Arabian author, resembled that described by Indian astro-

[1] If Claudian's epigram on the subject of it was founded upon any authority, the instrument must have been a sort of orrery, enclosed in glass.

Vide Claud. epigr. 18. Cic. Tusc. Quæst. i. 25. De Nat. Deor. ii. 35.

[2] Cic. De Nat. Deor. ii. 34.

[3] In the Hijra year 212, or A.D. 827, by Alházin ben Yúsaf, with the aid of Sergius (Montucla, ii. p. 304); or rather by Ishák ben Honain, whose death is placed about the Hijra year 260 (D'Herbelot, p. 456). According to the Kashf ul zunún, Ishák's version was epitomized by Hajjáj ben Yúsaf, by Thábit ben Korrah, and by Násiruddín Túsí. Other versions, however, are mentioned: particularly one by Hajjáj, said to have been corrected first by Honain ben Isháк, and afterwards by Thábit; another by Thábit himself; and a third by Muhí ben Yahyá. A different account is likewise given of the earliest translation of the Almijast, which is ascribed to Abú Hisán and Salmán, who are said to have completed it, after the failure of other learned men, who had previously attempted the translation. Mention is also made of a version by Ibráhím ben Salat, revised by Honain. But none of these translations are anterior to the ninth century of the Christian era.

[4] Adhibuit (Tycho) armillare quoddam instrumentum, quod tamen comperi ego positum et adhibitum olim fuisse ante Tychonem ab Alhazeno, lib. 7. opt. C. 1. prop. 15. et a Vitell. lib. 10. propos. 49. cujus instrumenti astronomice collocati ope atque usu, (vide instrumentum multiplex armillare apud Tycho. in Mechanicis Astronomiæ), eandem elevationem falsam 9 scrupulorum invenit, quam per alia duo diversa instrumenta compererat.—Bettini, *Apiaria*, vol. ii. p. 41.

nomers. At all events, he is more modern[1] than the oldest of the Hindu writers whom I shall proceed to quote.[2]

The construction of the armillary sphere is briefly and rather obscurely taught in the Súrya-siddhánta. The following is a literal translation.

"Let the astronomer frame the surprising structure of the terrestrial and celestial spheres.

"Having caused a wooden globe to be made, [of such size] as he pleases, to represent the earth; with a staff for the axis passing through the centre, and exceeding the globe at both ends; let him place the supporting hoops,[3] as also the equinoctial circle.

"Three circles must be prepared (divided for signs and degrees), the radius of which must agree with the respective diurnal circles, in proportion to the equinoctial: the three circles should be placed for the Ram and following signs, respectively, at the proper declination in degrees, N. or S.; the same answer contrariwise for the Crab and other signs. In like manner, three circles are placed in the southern hemisphere, for the Balance and the rest, and contrariwise for Capricorn and the remaining signs. Circles are similarly placed on both hoops for the asterisms in both hemispheres, as also for Abhijit; and for the seven Ṛishis, Agastya, Brahma, and other stars.

[350] "In the middle of all these circles is placed the equinoctial. At the intersection of that and the supporting hoops, and distant from each other half the signs, the two equinoxes should be determined; and the two solstices, at the degrees of obliquity from the equinoctial; and the places of the Ram and the rest, in the order of the signs, should be adjusted by the strings of the curve. Another circle, thus

[1] He wrote his treatise on optics and other works about the year 1100.—*Biogr. Dict.*

[2] Bháskara flourished in the middle of the twelfth century; being born, as he himself informs us, in the S'áka year 1036, answering to A.D. 1114. But the Súrya-siddhánta is more ancient.

[3] They are the colures.

passing from equinox to equinox, is named the ecliptic; and by this path, the sun, illuminating worlds, for ever travels. The moon and the other planets are seen deviating from their nodes in the ecliptic, to the extent of their respective greatest latitudes [within the zodiac]."

The author proceeds to notice the relation of the great circles before mentioned to the horizon; and observes, that, whatever place be assumed for the apex of the sphere, the middle of the heavens for that place is its horizon. He concludes by showing, that the instrument may be made to revolve with regularity, by means of a current of water; and hints, that the appearance of spontaneous motion may be given, by a concealed mechanism, for which quicksilver is to be employed. The manner of using this instrument for astronomical observations has been already explained (p. [324], etc.)

More ample instructions for framing an armillary sphere are delivered in the Siddhánta-śiromaṇi. The passage is too long for insertion in this place; and I reserve it for a separate article, on account of the explanations which it requires, and because it leads to the consideration of other topics,[1] which cannot be sufficiently discussed in the pre[351]sent essay. A brief abstract of Bháskara's description may here suffice. In the centre he places a small globe to represent the earth encompassed with circles for the orbits of the planets arranged like the curved lines in a spider's web. On an axis passing through the poles of the earth, and prolonged on both sides, a sphere, or assemblage of circles, is suspended, by means of rings or tubes adapted to the axis, so that the sphere may move freely on it. This assemblage of circles comprises a horizon and equator adjusted for the place, with a prime vertical and meridian, and two intermediate verticals (intersecting

[1] Among others, that of the precession of the equinoxes; respecting which different opinions are stated by Bháskara. It appears, from what is said by him, that the notion of a libration of the equinoxes has not universally prevailed among Hindu astronomers. The correcter opinion of a revolution of the equinoctial points was advanced by some authors, but has not obtained the general suffrage of Hindu writers on astronomy.

the horizon at the N.E. and S.W. and N.W. and S.E. points); as also the equinoctial colure. Another circle is suspended within this sphere on the poles of the horizon, apparently intended to measure the altitude and amplitude of an object.

Another sphere or assemblage of circles is in like manner suspended on the pole of the equator. It consists of both colures, and the equinoctial, with the ecliptic adjusted to it; and six circles for the planetary orbits duly adjusted to the ecliptic: as also six diurnal circles parallel to the equinoctial, and passing through the extremities of the several signs.

This, though not a complete description of Bháskara's armillary sphere, will convey a sufficient notion of the instrument for the purpose of the present comparison; and will justify the remark, that its construction differs greatly from that of the instrument specified by Ptolemy.

In the description of the armillary sphere cited from the Súrya-siddhánta, mention is made of several stars not included in the asterisms which mark the divisions of the ecliptic. The following table exhibits the positions of [352] those, and of the few other stars which have been particularly noticed by Hindu astronomers.

	Brahma-siddhánta and śiromaṇi.		*Graha-lághava.*		*Siddhánta-sárvabhauma.*		*Súrya-siddhánta.*	
	Lat.	Long.	Lat.	Long.	Lat.	Long.	Lat.	Long.
Agastya	77° S.	87°	76° S.	80°	77° 16′ S.	85° 5′	80° S.	90°
Lubdhaka, or the hunter	40° S.	86°	40° S.	81°	40° 4′ S.	84° 36′	40° S.	80°
Agni	—	—	8° N.	53°	8° 14′ N.	57° 4′	8° N.	52°
Brahmahṛidaya.	—	—	31° N.	56°	30° 49′ N.	58° 36′	30° N.	52° [1]
Prajápati, or *Brahmá*	—	—	39° N.	61°	38° 38′ N.	56° 53′	38° N.	57°
Apámvatsa	—	—	3° N.	183°	3° N.	183°	3° N.	180°
Ápas	—	—	—	—	—	—	9° N.	180°

[1] The S'ákalya-sanhitá and Tattwa-viveka agree with the Súrya-siddhánta as to the positions of the first four stars. They omit the other three.

The Seven Ṛishis, according to the S'ákalya-sanhitá.

	LAT.
KRATU	55° N.
PULAHA	50° N.
PULASTYA	50° N.
ATRI	56° N.
ANGIRAS	57° N.
VASISHṬHA	60° N.
MARÍCHI	60° N.

Here Agastya is evidently Canopus; as Lubdhaka is Sirius. Brahmahṛidaya seems to be Capella, which was shown, under that Indian name, to Dr. Hunter at Ujja[353]yiní. Agni may be the bright star in the northern horn of the Bull (β Tauri): Prajápati is perhaps the star on the head of the Waggoner (δ Aurigæ). The distances of the three last mentioned stars from the ecliptic do not exactly agree with the places stated: but no conspicuous stars are found nearer to the assigned positions: and it may be remarked, that they are all nearly in the longitude of the *nakshatra* Mṛigaśiras, corresponding to the head of Orion; and that the latitude assigned to them by Hindu astronomers is as much too small, as that of Mṛigaśiras is too great.

The star, mentioned in the Súrya-siddhánta under the name of Ápas or water, is doubtless δ Virginis; and Apámvatsa comprises the nebulous stars in the same constellation, marked b. 1. 2. 3.

Astronomers give rules for computing the heliacal rising and setting of the star Agastya, on account of certain religious ceremonies to be performed when that star appears. Varáhamihira says, 'Agastya is visible at Ujjayiní, when the sun is 7° short of the sign Virgo.' But he afterwards adds, that 'the star becomes visible, when the sun reaches Hasta, and disappears when the sun arrives at Rohiṇí.' His commentator remarks, that the author has here followed earlier

writers; and quotes Parásara, saying, 'When the sun is in Hasta, the star rises; and it sets when the sun is in Rohiṇí.'[1] Bhaṭṭotpala cites from the five Siddhántas[2] a rule of computation, analogous to that which will be forthwith quoted from the Bháswatí; and remarks, that three periods of Agastya's heliacal rising [354] are observed, *viz.* 8th and 15th of Áswina and 8th of Kárttika.

The Bháswatí directs the day of Agastya's rising for any particular latitude to be found by the following rule. 'The length of the shadow of a gnomon[3] at a particular latitude, on the day of the equinox, is multiplied by 25; and to the product 900 are added; the sum, divided by 225, gives in signs and degrees the place of the sun, on the day when Agastya rises or appears in the south, at the close of night.' The commentator adds, that 'the day of the star's setting may be computed by deducting the sum found as above, from 1350; the difference reduced to signs and degrees, is the place of the sun, on the day when Agastya sets in the southwest.' According to these rules, Agastya in latitude 26° 34′, rises when the sun is in 4^s 20° and sets when the sun is in 1^s 10°.

The Graha-lághava teaches another method of calculation. The length of the shadow of the gnomon is multiplied by 8, and the product is added to 98 for the sun's place in degrees, on the day when Agastya rises; or is deducted from 78, to find the sun's place when that star sets. By this rule, the star should rise, in latitude 26° 34′, when the sun is at the 26th degree of the Lion, and should set when the sun quits the Ram. Accordingly, the Bhavishya and the Brahma-vaivarta-puráṇas ordain oblations for Agastya three days before the sun reaches the zodiacal sign Virgo; though the inhabitants of the province of Gauḍa, as observed in the last-mentioned *puráṇa*, perform this ceremony three days earlier.

[1] दृश्यते स किल हस्तगते ऽर्के रोहिणीमुपगते ऽस्तमुपैति ।

[2] Pancha-siddhánta, a treatise by Varáhamihira.

[3] In duodecimal parts.

In regard to the passages above quoted, it may remarked, that the rule, stated in the Bháswatí, implies the distance of three signs, from the beginning of Aries, to [355] Agastya; and supposes the star to become visible when distant one sign from the sun. But the rule delivered in the Graha-lághava places the star at the distance of 88° from the beginning of Mesha, and supposes it visible in the right sphere, when 10° distant from the sun. According to the quotation from Parásara, the right ascension of the star must have been, in his time, not less than 100° reckoned from the beginning of Mesha; and the star, rising cosmically, became visible in the oblique sphere, at the distance of 60° from the sun; and disappeared setting acronychally, when within that distance. Making allowance, therefore, for the star's proper motion, and change of declination and right ascension, it remains probable, that Parásara's rule was framed for the north of India, at a period when the solstitial points were, as stated by that author, in the middle of Áśleshá and beginning of Dhanishṭha.[1]

I have purposely reserved for separate consideration the seven Ṛishis, who give name to seven stars in Ursa major; not only because their positions are not stated by Brahmagupta, Bháskara, and the Súrya-siddhánta, but also because the authors, who give their positions, ascribe to them a particular motion, or variation of longitude, different from other stars, and apparently unconnected with the precession of the equinoxes.

Varáhamihira has a chapter in the Váráhí-sanhitá expressly on the subject of this supposed motion of the Ṛishis. He begins by announcing the intention of stating their revolution conformably with the doctrine of Vṛiddha Garga, and proceeds as follows: 'When king Yudhishṭhira ruled the earth, the Munis were in Maghá, and the period of the era of that king is 2526 years. They [356] remain for a hundred years in each asterism, being connected with that particular

[1] As. Res., vol. ii. p. 393.

nakshatra, to which, when it rises in the east, the line of their rising is directed.'[1]

The commentator, Bhaṭṭotpala, supports the text of his author by quotations from Vṛiddha Garga and Káśyapa. 'At the junction of the Kali and Dwápara ages,' says Garga, 'the virtuous sages, who delight in protecting the people, stood at the asterism, over which the Pitṛis preside.' That is at Maghá. 'The mighty sages,' says Káśyapa, 'abide during a hundred years in each asterism, attended by the virtuous Arundhatí.'

The author next states the relative situation of the seven Ṛishis, with Arundhatí near her husband Vasishṭha; and the remainder of the chapter is devoted to astrology.

The revolution of the seven Ṛishis, and its periods, are noticed in *puráṇas*. The following passage is from the Śrí Bhágavata.[2]

'From your birth (Parikshit is addressed by Śuka) to the inauguration of Nanda, 1115 years will elapse.

[357] 'Of the seven Ṛishis, two are first perceived, rising in the sky; and the asterism, which is observed to be at night even with the middle of those two stars, is that with which the Ṛishis are united, and they remain so during a hundred years of men. In your time, and at this moment, they are situated in Maghá.

'When the splendour of Vishṇu, named Kṛishṇa, departed for heaven, then did the Kali age, during which men delight

[1] आसन्मघासु मुनयः शासति पृथ्वीं युधिष्ठिरे नृपतौ ।
षड्द्विकपञ्चद्वियुतः शककालस्तस्य राज्यस्य ।
एकैकस्मिन्नृक्षे शतं शतं ते चरन्ति वर्षाणाम् ।
प्रागुदयतोऽप्यविवरादृजूदयं तत्र संयुक्ताः ॥

According to a different reading noticed by the commentator, the concluding hemistich signifies "they constantly rise in the north-east; together with Arundhatí."

प्रागुत्तरतश्चैते सदोदयन्ते ससाध्वीकाः ।

[Dr. Kern's ed. reads (p. 85) *rájnaścha* for *rájyasya*.]

[2] Book xii. c. 2.

in sin, invade the world. So long as he continued to touch the earth with his holy feet, so long the Kali age was unable to subdue the world.

'When the seven Ṛishis were in Maghá, the Kali age comprising 1200 [divine] years[1] began; and when, from Maghá, they shall reach Púrváshádha, then will this Kali age attain its growth under Nanda and his successors.'

The commentator Śrídhara-swámí remarks, that the constellation, consisting of seven stars, is in the form of a wheeled carriage. Maríchi, he observes, is at the extremity; and next to him, Vasishṭha in the arched part of the yoke; and beyond him Angiras: next to whom are four stars in a quadrangle: Atri at the north-east corner; south of him Pulastya; next to whom is Pulaha; and Kratu is north of the last. Such being their relative position, the two stars, which rise first, are Pulaha and Kratu; and whichever asterism is in a line south from the middle of those stars, is that with which the seven Ṛishis are united; and they so remain for 100 years.

A similar passage is found in the Vishṇu-puráṇa,[2] and a similar exposition of it is given by the commentator Ratnagarbha: but the period, there stated to elapse between the birth of Parikshit and the inauguration of Nanda, is 1015 years only.

[358] The Matsya-puráṇa contains a passage to the like effect; but allows 1050 years from the birth of Parikshit to the inauguration of Mahápadma; and the seven Ṛishis are stated as being in a line with the constellation sacred to fire (that is Kṛittiká), 836 years later, in the time of the Andhra kings.

In the Brahma-siddhánta of Śákalya, denominated from its reputed author Śákalya-sanhitá, the supposed motion of the seven Ṛishis is thus noticed:[3] 'At the commencement of the

[1] 432,000 common years. [2] Part 4, ch. xxiii. v. 32, etc.
[3] Praśna 2, ch. ii.

yuga, Kratu was near the star sacred to Vishṇu (Śravaṇá), at the beginning of the asterism. Three degrees east of him was Pulaha; and Pulastya at ten degrees from this; Atri followed at three degrees from the last; and Angiras at eight degrees from him; next came Vasishṭha, at the distance of seven degrees; and lastly, Maríchi at ten. Their motion is eight *liptás* (minutes) in a year. Their distances from the ecliptic, north, were respectively 55°, 50°, 50°, 56°, 57°, 60°, and 60°. For, moving in the north into different positions, the sages employ 2700 years in revolving through the assemblage of asterisms; and hence their positions may be easily known at any particular time.'

Lalla, cited by Muníśwara in his gloss on the Śiromaṇi, says, 'If the number of years of the Kali age, less fourteen, be divided by 100, the quotient, as the wise declare, shows the asterisms traversed by Maríchi and other celestial sages, beginning from the asterism of Viranchi (Brahmá).'

Here Lalla is generally understood to mean Rohiṇí, which is sacred to Prajápati (or Brahmá). But Muníśwara has remarked, in another place, that Lalla may intend Abhijit, which is sacred to Vidhi or Brahmá; [359] and consequently may mean Śravaṇá, of which Abhijit forms a part: and thus Lalla and Śákalya may be reconciled.

Most of the commentators on the Súrya-siddhánta and Śiromaṇi are silent on the subject of the seven Ṛishis. But Nṛisinha, in his *várttiká* to the Vásaná-bháshya, or gloss on the Śiromaṇi, quotes and expounds the Śákalya-sanhitá, and rejects Varáha's rule of computation, as disagreeing with *puráṇas*. Muníśwara, in his commentary on the Śiromaṇi, cites some of the passages above noticed, and remarks, that Bháskara has omitted this topic on account of contradictory opinions concerning it, and because it is of no great use.

The same author, in his own compilation entitled Siddhánta-sárvabhauma, has entered more fully into this subject. He observes, that the seven Ṛishis are not, like other stars,

attached by spikes to the solid ring of the ecliptic, but revolve in small circles round the northern pole of the ecliptic, moving by their own power in the ethereal sphere above Saturn, but below the sphere of the stars. He places the Ṛishis in the same relative positions, which Śákalya had assigned to them; states in other terms the same distances from the ecliptic, and the same annual motion; and directs their place to be computed by deducting 600 from the years of the Kali age, doubling the remainder and dividing by fifteen: the quotient, in degrees, is divided by 30, to reduce it into signs. Muníśwara supports this mode of calculation on the authority of Śákalya, against Varáhamihira and Lalla; and affirms, that it agrees with the phenomena, as observable at the period of his compilation. It appears, however, to be a correction of Śákalya's rule.

Kamalákara, in the Tattwaviveka, notices the opinion delivered in the Siddhánta-sárvabhauma; but observes, [360] that no such motion of the stars is perceptible. Remarking, however, that the authority of the *puráṇas* and *sanhitás*, which affirm their revolution, is incontrovertible, he reconciles faith and experience by saying, that the stars themselves are fixed; but the seven Ṛishis are invisible deities, who perform the stated revolution in the period specified.

If Kamalákara's notion be adopted, no difficulty remains: yet it can hardly be supposed, that Varáhamihira and Lalla intended to describe revolutions of invisible beings. If then it be allowed, that they have attributed to the stars themselves an imaginary revolution grounded on an erroneous theory, a probable inference may be thence drawn as to the period when those authors lived, provided one position be conceded; namely, that the rules, stated by them, gave a result not grossly wrong at the respective periods when they wrote. Indeed it can scarcely be supposed, that authors, who, like the celebrated astronomers in question, were not mere compilers and transcribers, should have exhibited rules of computation,

which did not approach to the truth, at the very period when they were proposed.

If this reasoning be admitted, it would follow that Varáhamihira composed the Váráhí-sanhitá about 2800 years after the period assigned by him to the commencement of the reign of Yudhishṭhira, or near the close of the third century after the expiration of Yudhishṭhira's era as defined by him. For the circle of declination passing between Kratu and Pulaha (the two first of the seven Ṛishis), and cutting the ecliptic only 2° short of the beginning of Maghá, was the solstitial colure, when the equinox was near the beginning of Kṛittiká; and such probably was the reason of that line being noticed by ancient Hindu astronomers. It agrees with the solstitial [361] colure on the sphere of Eudoxus, as described by Hipparchus.[1] A similar circle of declination, passing between the same stars, intersected the ecliptic at the beginning of Maghá when the solstitial colure was at the middle of Áśleshá; and a like circle passed through the next asterism, when the equinox corresponded with the first point of Mesha. An astronomer of that period, if he were apprised of the position assigned to the same stars by Garga, reputed to have been the priest of Kṛishṇa and the Páṇḍus, might conclude with Varáhamihira, that one revolution had been completed, and that the stars had passed through one *nakshatra* of the second revolution. In corroboration of this inference respecting the age of Varáhamihira's astrological treatise, it may be added, that he is cited by name in the Panchatantra, the

[1] "Hipparchus tells us, that Eudoxus drew the colure of the solstices through the middle of the Great Bear; and the middle of Cancer; and the neck of Hydrus; and the star between the poop and mast of Argo; and the tail of the South Fish; and through the middle of Capricorn, and of Sagitta; and through the neck and right wing of the Swan; and the left hand of Cepheus; and that he drew the equinoctial colure through the left hand of Arctophylax; and along the middle of his body; and cross the middle of Chelæ; and through the right hand and fore-knee of the Centaur; and through the flexure of Eridanus and head of Cetus; and the back of Aries across, and through the head and right hand of Perseus." Sir I. Newton's *Chronology*, § 29. Hipparch. *ad Phænom. in* Petavii *Uranologia*, pp. 207, 208. Bailly, *Astr. Anc.* p. 506. Costard, p. 136.

original of the fables of Pilpay, which were translated for Núshírván more than 1200 years ago.[1]

The theory being wholly unfounded, Varáhamihira's rule of computation soon ceased to agree with the phenomena, and other rules have been successively introduced by different authors, as Lalla, Śákalya, and lastly, [362] Muniśwara; whose rule, devised less than two hundred years ago, does not yet grossly betray its insufficiency.

This pretended revolution of the stars of Ursa Major is connected with two remarkable epochas in Indian chronology; the commencement of the Kali *yuga* or sinful age, in the reign of Yudhishṭhira; and its prevalence, on the failure of the succession of Kshatriya princes, and establishment of a different dynasty, 1015 years after the birth of Parikshit, according to the Vishṇu-puráṇa; or 1115 years, according to the Bhágavata; but 1498 years, if a correction, which has been proposed by Śrídhara-swámí and some other commentators, be admitted. This subject has been already noticed by Capt. Wilford in his Essay on Vikramáditya;[2] and it is, therefore, unnecessary to enlarge upon it in this place.

It has been noticed, towards the beginning of the present essay, that the principal star of each *nakshatra* is denominated Yogatárá. Perhaps it may not be superfluous to caution the reader against confounding these *yoga* stars with the *yogas*, of which a list is inserted in Sir William Jones's Treatise on the Indian Zodiac.[3] They are mentioned by him as divisions of the ecliptic: but it will presently appear, that they cannot in strictness be so denominated. Their principal purpose regards astrology; but they are also employed in regulating certain movable feasts; and they are of such frequent use that every Indian almanac contains a column specifying the *yoga* for each day, with the hour of its termination.

[1] Preface to the Sanskrit edition of the *Hitopadeśa*, p. xi. [page 153 of the present volume.]

[2] As. Res., vol. ix. p. 117, etc.

[3] As. Res., vol. ii. p. 302.

The *yoga* is nothing else than a mode of indicating the sum of the longitudes of the sun and moon. The rule for its computation, as given in the Súrya-siddhánta, Bháswatí, and Graha-lághava, directs that the longitude of the [363] sun be added to the longitude of the moon; and the sum, reduced to minutes, is to be divided by 800 (the number of minutes in 13° 20′): the quotient exhibits the elapsed *yogas*, counted from Vishkumbha.[1] It is obvious, therefore, that the *yogas* are twenty-seven divisions of 360° of a great circle, measured upon the ecliptic. But, if they be represented on a circle, it must be a movable one in the plane of the ecliptic.

Astrologers also reckon twenty-eight *yogas*, which correspond to the twenty-eight *nakshatras* or divisions of the moon's path; varying, however, according to the day of the week. As the Indian almanacs sometimes appropriate a column to the moon's *yoga* for each day, I shall insert in a note a list of these *yogas*, with the rule by which they are determined.[2]

[1] 1. Vishkumbha. 2. Príti. 3. Áyushmat. 4. Saubhágya. 5. S'obhana. 6. Atigaṇḍa. 7. Sukarman. 8. Dhṛiti. 9. S'úla. 10. Gaṇḍa. 11. Vṛiddhi. 12. Dhruva. 13. Vyágháta. 14. Harshaṇa. 15. Vajra. 16. Siddhi. 17. Vyatipáta. 18. Varíyas. 19. Parigha. 20. S'iva. 21. Siddha. 22. Sádhya. 23. S'ubha. 24. S'ukla. 25. Brahman. 26. Aindra. 27. Vaidhṛiti.

[2] 1. Ánanda. 2. Káladaṇḍa. 3. Dhúmra. 4. Prajápati. 5. Saumya. 6. Dhwánksha. 7. Dhwaja. 8. S'rívatsa. 9. Vajra. 10. Mudgara. 11. Chhatra. 12. Maitra. 13. Mánasa. 14. Padma. 15. Lambuka. 16. Utpáta. 17. Mṛityu. 18. Káṇa. 19. Siddhi. 20. S'ubha. 21. Amṛita. 22. Musula. 23. Gada. 24. Mátanga. 25. Rákshasa. 26. Chara. 27. Sthira. 28. Pravardha.

The foregoing list is extracted from the Ratnamálá of S'rípati. He adds the rule by which the *yogas* are regulated. On a Sunday the *nakshatras* answer to the *yogas*, in their natural order; viz. As'winí to Ánanda, Bharaṇí to Káladaṇḍa, etc. But on a Monday the first *yoga* (Ánanda) corresponds to Mṛigas'iras, the second to Árdrá, and so forth. On a Tuesday, the *nakshatra*, which answers to the first *yoga*, is Ás'leshá; on Wednesday, Hasta; on Thursday, Anurádha; on Friday, Uttarásháḍha; and on Saturday, S'atabhishá.*

Almanacs usually contain another set of astrological divisions of the lunar

* [The regulation of the *yogas* evidently depends on the rule which is given at the close of the essay on weights and measures for the planetary regulation of the hours and days of the week. If As'winí correspond with A'nanda, or the first *ghurri* of Sunday, and the list be carried through the sixty *ghurris* of the day, the list of twenty-eight mansions will have been gone through twice, and the four first on the list three times. Mrigas'iras is the fifth mansion, and thus becomes regent of the first *ghurri* of Monday. It is by a similar process that the names of the days of the week in modern usage are determined. See Dion Cassius. —SIR E. T. C.]

[364] Another topic relative to the zodiac, and connected with astrology, remains to be noticed. I allude to the Dreshkáṇas answering to the Decani of European astrologers. The Hindus, like the Egyptians and Babylonians, from whom that vain science passed to the Greeks and Romans, divide each sign into three parts, and allot to every such part a regent exercising planetary influence under the particular planet whom he there represents.

The description of the thirty-six *dreshkáṇas* is given towards the close of Varáhamihira's treatise on the casting of nativities, entitled Vṛihat-játaka. It is here translated conformably with the gloss of Bhaṭṭotpala: omitting, however, some variations in the reading of the text, which are noticed by him; but which can be of no use, unless occasion should arise for reference to them in comparing the description of the *dreshkáṇas* with some amulet or ancient monument in which the Decani may be supposed to be figured. Even for that purpose the following description will probably suffice.

1. [MARS] A man with red eyes, girt round the waist [365] with a white cloth, of a black complexion, as formidable as able to protect, holds a raised battle-axe.

2. [The SUN] A female, clad in red apparel, with her mind fixed on wearing ornaments, having a mare's head, and

month, which it may be proper to explain. They are denominated Karaṇa; and consist of seven variable and four invariable, as in the subjoined list:

Variable Karaṇas.	Invariable Karaṇas.
1. Bava.	1. S'akuni.
2. Bálava.	2. Chatushpád.
3. Kaulava.	3. Nága.
4. Taitila.	4. Kintughna.
5. Gara.	
6. Vaṇij.	
7. Vishṭi.	

They answer successively to half a *tithi* or lunar day; Kintughna being always assigned to the first half of the first *tithi;* and the variable *karaṇas* afterwards succeeding each other regularly, through eight repetitions: they are followed by the three remaining invariable *karaṇas,* which conclude the month; Chatushpád and Nága appertaining to Amávásyá or the new moon, and S'akuni being appropriated to the latter half of the preceding *tithi.*

a belly like a jar, thirsty and resting on one foot, is exhibited by Yavana as the figure of the *dreshkáṇa* in the middle of Mesha.[1]

3. [JUPITER] A fierce and wrathful man, conversant with arts, of a tawny complexion, solicitous of action, but unsteady in his resolves; holds in his hands a raised stick, and wears red clothes. He is the third in the tripartite division of Mesha.

4. [VENUS] A woman with hair clipped and curled, a body shaped like a jar, her clothes burnt, herself thirsty, disposed to eat, and fond of ornaments: such is the figure of the first in Vṛishabha.

5. [MERCURY] A man with the head of a goat, and a shoulder like a bull, clothed in dirty apparel, skilful in regard to the plough and the cart, acquainted with field, grain, house, and kine, conversant with arts; and in disposition voracious.

6. [SATURN] A man with a body vast as an elephant's, and feet great as a Śarabha's,[2] with white teeth and a tawny body, his mind busied upon the wool of wild sheep, occupies the extremity of the sign Taurus.

7. [MERCURY] Such as are conversant with the subject declare the first in the tripartite partition of the third sign to be a woman fond of working with the needle, beautiful, delighting in ornaments, childless, amorous, and with her arms elevated.

[366] 8. [VENUS] In the middle of the sign Gemini is a man, with the face of a *garuḍa*,[3] standing in a grove; he is an archer clad in armour, and holds a bow; he meditates on sport, his children, ornaments, and wealth.

9. [SATURN] At the end of the sign Gemini is a man decorated with ornaments, having as many gems as the ocean

[1] "*Meshamadhye dreshkáṇarúpam yavanopadishṭam.*" Bhaṭṭotpala expounds this "declared by Yavanáchárya," "*Yavanácháryaiḥ kathitam.*"

[2] A monster with eight legs, who destroys elephants.

[3] An eagle, or else a gigantic crane. Perhaps a vulture.

contains; clad in armour and furnished with bow and quiver; skilled in dance, music, and song, and practising poetry.

10. [The Moon] The wise declare the first in Cancer to be an animal with the body of an elephant, the feet of a Śarabha, a boar's head and horse's neck, standing in a grove under a sandal-wood tree,[1] and upholding leaves, root, and fruit.

11. [Mars] In the middle of the sign Cancer, a woman, in prime of youth, with blossoms of lotus on her head, attended by a serpent, cries while standing in a forest, resting against the branch of a *paláśa*[2] tree.

12. [Jupiter] Last in Cancer is a man with his head inclined; he is decorated with golden ornaments, and, embarking on a vessel and encompassed by serpents [twined round him], he traverses the ocean to seek ornaments for his wife.

13. [The Sun] A vulture and shakal stand on a cotton tree:[3] a dog is near: and a man, in a squalid dress, laments for his father and mother. This representation is pronounced to be the first of the Lion.

14. [Jupiter] A man formed like a horse, bearing on his head a garland of yellowish-white flowers, wears a leather dress: unconquered like a lion; armed with a bow, and [367] distinguished by a hooked nose; he is placed in the middle of Leo.

15. [Mars] The third in the tripartite division of Leo is a man having the head of a bear, with a long beard and curled hair; in disposition similar to an ape; and holding a staff, fruits, and flesh.

16. [Mercury] A damsel, bearing a jar filled with blossoms, (her person clothed in apparel soiled with dirt,) solicitous for the union of dress with opulence, is going towards the family of her spiritual parent: such is the first of Virgo.

17. [Saturn] A man of a dark complexion, with a cloth on his head, holds a pen, and is casting up accounts of receipts

[1] *Santalum album sive Sirium myrtifolium.*

[2] *Butea frondosa.*

[3] *Bombax heptaphyllum.*

and disbursements: he bears a large bow, and his body is covered with hair: he is placed in the middle of the sign.

18. [VENUS] A woman of a fair complexion, dressed in bleached silk, tall, holding in her hand a jar and ladle; is devoutly going towards a temple of the gods. The wise pronounce this to be the last of Virgo.

19. [VENUS] A man is proceeding along the middle of a highway; holding a balance, and having weights in his hand; he is skilled in measuring and meting, and meditates on commodities and their prices. The Yavanas declare this form to be the first of Libra.[1]

20. [SATURN] A man with the head of a vulture, carrying a water-pot, is anxious to proceed, being hungry and thirsty; in thought he visits his wife and son. He is middlemost of the balance-bearer (Libra).

[368] 21. [MERCURY] A man, in figure like an ape, adorned with gems, bearing a golden quiver and armour, and carrying fruits and flesh, is scaring deer in a forest: such is the figure exhibited by the Yavanas.[2]

22. [MARS] A woman, without clothes or ornaments, comes from the great ocean to the shore; she has fallen from her place; round her feet are serpents entwined; but she is pleasing: such is the first of the sign Scorpio.

23. [JUPITER] A woman, with a body like a tortoise and a jar, and with serpents entwined round her person; is solicitous to prepare local comforts for her husband. This figure the wise pronounce to be the middle one of Scorpio.

24. [The MOON] The last of the Scorpion is a lion with a large and stooping head, resembling that of a tortoise; he guards the place where sandal-wood grows, terrifying dogs, deer, boars, and shakals.

[1] "*Tadrúpam vadanti Yavanáḥ prathamam tuláyáḥ.*" This might signify "Yavana declares," for the plural is used in Sanskrit respectfully, and Bhaṭṭotpala has before expounded Yavana as intending Yavanácharya; but a different explanation occurs a little lower.

[2] "*Yavanair uddhṛitaḥ,*" which Bhaṭṭotpala expounds "declared by the ancient Yavanas," "*puráṇayavanaiḥ.*"

25. [Jupiter] An animal with the body of a horse and head of a man, holding a large bow, stands near a hermitage and devoutly guards the implements of sacrifice: such is the first of the three divisions of the bow (Sagittarius).

26. [Mars] A pleasing female, of golden complexion, like the *champaka*,[1] moderately handsome, sits on a throne, distributing marine gems. This is described as the middle division of the bow.

27. [The Sun] A man with a long beard, of a complexion yellow like the *champaka*, is sitting on a throne with a staff in his hand; he wears silk raiment and a deer's skin: such is the third figure of the ninth sign.

28. [Saturn] A man, of a terrible aspect, with the [369] body of a hog, hairy, having tusks like a Makara,[2] holds a yoke, a net, and fetters. He is first of Capricorn.

29. [Venus] In the middle of Makara is a woman skilled in music, with eyes large like the petals of the lotus, and with a dark complexion. She seeks various things; she is decorated with jewels; and wears metallic ornaments in her ears.

30. [Mercury] A man, shaped like a Kinnara,[3] clothed in a woollen cloth, and furnished with quiver, bow, and armour, bears on his shoulder a jar adorned with gems: he is last of the sign Makara.

31. [The Sun] The first of the jar (Aquarius) is a man with the head of a vulture, clothed in silk and wearing an antelope's hide with a woollen cloth: his mind is busied in obtaining oil, ardent spirits, water, and food.

32. [Mercury] In a burnt carriage, a woman clad in soiled apparel, bearing vessels on her head, is collecting metals in a forest containing cotton trees.

33. [Venus] A man of a dark complexion, with hairy ears, adorned with a diadem, carries and transports vases with

[1] *Michelia Champaca.*

[2] A sea monster. Perhaps the Narwhal may be intended.

[3] A human figure with the head of a horse.

articles of metal, and with bark, leaves, gum, and fruit. He is last of Kumbha.

34. [JUPITER] The first of the fish (Pisces) navigates the sea in search of ornaments for his wife; he has jewels, and his hands are full of vessels used in sacrifice, together with pearls, gems, and shells.

35. [The MOON] A woman, surpassing in complexion the blossom of the *champaka*, ascends a ship with lofty masts and flags, and approaches the shore of the sea, accompanied by her retinue. This is declared by sages to be the second in the tripartite division of Mína.

[370] 36. [MARS] Near a cavern, in a forest, a naked man, with serpents entwined round his body, and tormented by robbers and fire, laments. He is the last of the fish.

Arabian astronomers in like manner divide each sign of the zodiac into three parts, denominated Wajh (وجه), or in the plural Wujúh (وجوه), which severally belong to the different planets[1] thence called Rabb ul wajh. The proper import of the term (وجه) is face or countenance; agreeing with the Greek πρόσωπον, which is similarly employed in this acceptation.[2]

The near correspondence of the *dreshkáṇas* with the Decani of Roman authors and Δεκανοὶ of Grecian writers will be evident from the following passage of Manilius, supported by quotations from other authors, which I shall insert on the faith of Saumaise;[3] the original works from which they are taken not being here procurable.

Manilius says:[4]

> Quam partem decimam dixere Decania gentes;
> A numero nomen positum est, quod partibus astra
> Condita tricenis propria sub sorte feruntur,
> Et tribuunt denas in se coeuntibus astris,
> Inque vicem terris habitantur sidera Signis.

[1] In the following order, beginning from Aries, viz. Mars, the Sun, Venus, Mercury, the Moon, Saturn, Jupiter, Mars, the Sun, etc.—*Ikhwánu'l Safá*.

[2] Firmici *Mathesis seu Astron.*, vide infrà.

[3] Salmasii *Plinianæ Exercitationes*, p. 460, etc.

[4] Lib. iv., 298-302.

Hephæstion expressly declares,[1] that "each sign of the zodiac is divided into three Decani comprising ten [371] degrees each; the first division of Aries is named Chontare; the second Chontachre; and the third Sicet."

Firmicus differs in the names, and does not allow ten complete degrees to each Decanus. Thus, in the sign Aries, the three first degrees are, according to him, unappropriated; the five next belong to the first Decanus Asitan; the next nine are vacant; and the four following appertain to the second Decanus Senacher; five degrees are again unoccupied; and the four last belong to the third Decanus Sentacher.[2]

We learn from Psellus[3] that the several Decani were figured with different attributes and dresses; and from Demophilus and Firmicus[4] that they represent the planets. The first appertained to Mars; the second to the Sun; and the third to Venus (the Hindu author says, Jupiter).

This astrological notion was confessedly received from foreign nations. The doctrine seems to be ascribed by Firmicus to Nekepso, king of Egypt;[5] and Psellus cites a Babylonian author, whom he calls Teucer, and who is also noticed by Porphyrius; besides, the names of [372] the Decani, stated by Hephæstion and Firmicus, are decidedly barbarous. It was not, therefore, without reason, that Saumaise and Kircher sought a derivation of the word *Decanus* itself from a foreign language. It cannot be deduced, as Scaliger proposes, from the similar term for an inferior officer commanding

[1] *Καὶ ἔστιν ὁ μὲν πρῶτος χονταρὲ, ὁ δὲ δεύτερος χονταχρὲ, ὁ τρίτος σικέτ.*

[2] Salmasii, *Plin. Exerc.*, p. 460.

[3] *Εἰσὶ γὰρ ἐν ἑκάστῳ τῶν ζωδίων τρεῖς κατειλεγμένοι Δεκανοὶ ποικιλόμορφοι, ὁ μὲν κατέχων πέλεκυν, ὁ δ' εἰς ἄλλο τι ἐσχηματισμένος εἴκασμα. ὧν εἰ τὰ εἴδη καὶ τὰ σχήματα δακτυλίων ἐγγλύψεις σφενδόναις, ἀποτρόπαια δεινῶν φανήσεται. ταῦτα μὲν οὖν ὁ Τεῦκρος καὶ οἱ κατ' ἐκεῖνον περιττοὶ τὰ μετέωρα.*

[4] "Primum *πρόσωπον* est is planeta cujus signum est: secundum *πρόσωπον* planeta sequens, et sic deinceps. Aries est Martis primum *πρόσωπον*, secundum Solis, tertium Veneris, juxta seriem errantium." This agrees precisely with the Arabian وجه.

[5] Sic et Nekepso, Ægypti justissimus imperator, et astrologus valde bonus, per ipsos Decanos omnia vitia valetudinesque collegit, ostendens quam valetudinem quis Decanus efficeret, etc.

ten men;[1] since this office and its designation were first introduced later than the time of Manilius, by whom the astrological term is employed; and Porphyrius expressly affirms that the word was used by those whom he denominates 'ancients.'[2] Huet, not concurring in either of the opinions above mentioned, supposes the term to have been corruptly formed by the astrologers of Alexandria from the Greek numeral with a Latin termination.[3] If this be admitted, it still remains not improbable that some affinity of sound, in the Egyptian or in the Chaldaic name, may have suggested the formation of this corrupt word.

The Sanskrit name apparently comes from the same source. I do not suppose it to be originally Sanskrit, since in that language it bears no etymological signification. For the same reason, it is likely that the astrological doctrine itself may be exotic in India. One branch of divination, entitled Tájaka, has been confessedly borrowed from the Arabians; and the technical terms used in it are, as I am informed by Hindu astrologers, Arabic. The casting of nativities, though its practice is of more ancient date in India, may also have been received from Western astrologers: Egyptians, Chaldeans, or even Greeks. If so, it is likely that the Hindus may have received astronomical hints at the same time.

[373] By their own acknowledgment,[4] they have cultivated astronomy for the sake of astrology; and they may have done so with the aid of hints received from the same quarter, from which their astrology is derived. In the present instance Varáhamihira himself, as interpreted by his commentator, quotes the Yavanas (meaning perhaps Grecian authors), in a

[1] Erant Decani denis militibus propositi. Veget. 2. 8.

[2] Οὓς τινας ἐκάλεσαν δεκανοὺς οἱ παλαιοί.

[3] Huetii *Animadversiones ad Manilium*, lib. iv. v. 298.

[4] Bháskara expressly says, "By ancient astronomers, the purpose of the science is declared to be judicial astrology; and that, indeed, depends on the influence of configurations; and these, on the apparent places of the planets."—*Golúdhyáya*, 1. v. 6. [*Vide* Note O. to the *Dissertation on the Algebra of the Hindus*, where this question is further investigated.]

manner which indicates, that the description of the *dreshkáṇas* is borrowed from them.

The name of Yavanáchárya, who is cited by Bhaṭṭotpala, would not be alone decisive. He is frequently quoted by Hindu astronomers: and it is possible, though by no means certain, that, under this name, a Grecian or an Arabian author may be intended. To determine that point, it will be requisite (unless the work attributed to him be recovered) to collect all the passages, in which Yavanáchárya is cited by Sanskrit authors; and to compare the doctrines ascribed to him with those of the Grecian and Arabian writers on astronomy. Not being prepared for such a disquisition, I shall dismiss this subject for the present, without offering any positive opinion on the question, which has been here proposed.

XV.

ON THE NOTION OF THE HINDU ASTRONOMERS CONCERNING THE PRECESSION OF THE EQUINOXES AND MOTIONS OF THE PLANETS.

[From the *Asiatic Researches*, vol. xii. pp. 209—250.
Calcutta, 1816. 4to.]

[374] In an essay on the Indian and Arabian divisions of the Zodiac, inserted in the ninth volume of the *Asiatic Researches*, I adverted to a passage of Bháskara, on the precession of the equinoxes, and intimated an intention of further noticing this subject in a separate essay.[1] The passage which I had then in view, occurs in Bháskara's description of the armillary sphere.[2] It appears to me deserving of distinct examination for the information which it contains, the difficulties which it presents, and the variety of topics which it suggests. I shall here quote the original, and add a verbal translation.

विषुवत्क्रान्तिवलययोस्सम्पातः क्रान्तिपातः स्यात् ।
तद्भगणाः सौरोक्ता व्यस्ता अयुतत्रयं कल्पे ॥ १७ ॥
अयनचलनं यदुक्तं मुञ्जालाद्यैः स एवायम् ।
तत्पक्षे तद्भगणाः कल्पे गोङ्गर्तुनन्दगोचन्द्राः ॥ १८ ॥

'The intersection of the ecliptic and equinoctial circles is

[1] As. Res. vol. ix. p. 353 (p. [350] of the present volume.)
[2] Goládhyáya, c. 6. v. 17 and 18.

the Krántipáta, or intersecting point of the sun's path. [375] Its revolutions, as declared on the authority of Súrya (Sauroktáḥ), are retrograde three myriads in a *kalpa*. This is the same with the motion of the solstice, as affirmed by Munjála, and others. But, according to their doctrine, its revolutions are 199,669 in a *kalpa*.'

This is the very passage to which the commentator on the Súrya-siddhánta, cited by Mr. Davis,[1] alludes, where he says, 'the meaning of Bháskara-áchárya was not that Súrya [in the Súrya-siddhánta] gave 30,000 as the revolutions of the places of the colures, in a *kalpa*; the name he used being Saura, not Súrya, and applied to some other book.'

It is certainly true, as here observed by this commentator, that Bháskara's quotation does not agree with the text of the Súrya-siddhánta, which expresses, 'The circle of the asterisms moves eastward thirty scores in a *yuga*. Multiplying the number of elapsed days by that, and dividing by the terrestrial days, [which compose the cycle], the quantity obtained is an arc, which, multiplied by three, and divided by ten,[2] gives degrees (*anśa*) termed *ayana* [or the place of the colure].'

त्रिंशत्कृत्वो युगे भानां चक्रं प्राक्परिलम्बते ।
तद्गुणाद्भूदिनैर्भक्ताद्द्युगणाद्यदवाप्यते ।
तद्दोस्त्रिघ्ना दशाप्तांशा विज्ञेया अयनाभिधा ॥

Here the number of revolutions is 600 in a *yuga*, answering to 600,000 in a *kalpa*; and not, as stated by Bháskara, 30,000. But the commentator's mode of reconciling the contradiction, by supposing a different book from the Súrya-siddhánta to have been intended, is incom[376]patible with Bháskara's own explanation of his text in the Vásaná-bháshya, containing annotations by himself on his own treatise. He there says in express words, 'the revolutions of the intersecting

[1] As. Res. vol. ii. p. 267.

[2] Ratio of 27° to 90°.

point of the sun's path are stated in the Súrya-siddhánta as amounting to 30,000 in a *kalpa*.'[1]

अतोऽस्य क्रान्तिपातस्य भगणाः कल्पेऽयुतत्रयं तावत्सूर्यसिद्धान्तोक्ताः ॥

His commentator, Muniśwara, has therefore recourse to other expedients for reconciling the contradiction between Bháskara's quotation and the text of the Súrya-siddhánta. Some, he observes, have proposed to read *niyuta* 'a hundred thousand,' for *ayuta* 'a myriad.'[2] Others have supposed the *kalpa* to be a twentieth part only of the period usually so denominated. The commentator further suggests the resolution of the term *vyastáḥ*, translated 'retrograde,' into *vi* for *vinśati* 'twenty,' and *astáḥ* which he makes to signify 'multiplied,' and expounds the phrase, 'thirty thousand multiplied by twenty.' But, dissatisfied with this and with another exposition, by which *trayam* 'three' is construed into 'sixty,' he gives the [377] preference to an equally strained interpretation, which divides the sentence into two members: 'its revolutions are declared by Súrya, and [according to a different authority] are retrograde three myriads in a *kalpa*.'

However unsatisfactory these explanations of the text may be, they prove the concurrence of the commentators of both works, in the received interpretation of the obscure passage of the Súrya-siddhánta, which is the subject of their discussion. That interpretation is supported by corresponding passages of the Soma-siddhánta, Laghu-vasishṭha, and Śákalya-sanhitá, in which the number of six hundred revolutions is explicitly

[1] Bháskara's Vásaná-bháshya on the astronomy and spherics of his Siddhánta-śiromaṇi. This volume of annotations is commented, with the S'iromaṇi, by Nṛisinha in the Vásaná-várttika, as proceeding from the same writer; and is expressly acknowledged to be a work of the author of the text (as it actually purports) by the scholiast Munís'wara, in this very place, where he is endeavouring to support his own interpretation of the text, against the apparent and natural sense of a passage in the author's notes.

[2] He alludes either to the Vásaná-várttika, in which that emendation of the text is actually suggested by the annotator Nṛisinha, or to some earlier commentary in which the same conjectural emendation may have been originally proposed.

stated:[1] as well as by other quotations, which clearly demonstrate that a libration of the equinoxes, at the rate of six hundred in a *yuga*, was there meant. For, in all the passages quoted, the revolution, as it is termed, of the equinoctial points, consists in a libration of them within the limits of twenty-seven degrees east, and as many west, of the beginnings of Aries and Libra: and that such is the meaning conveyed in the text of the Súrya-siddhánta, is distinctly shown by the [378] commentator cited by Mr. Davis,[2] as well as by the other commentators on that work.

The same doctrine is taught in the Páráśara-siddhánta, as quoted by Muníśwara; and, if we may rely on the authority of a quotation by this author from the works of Áryabhaṭṭa, it was also maintained by that ancient astronomer; but, according to the first-mentioned treatise, the number of librations amounts to 581,709, and according to the latter, 578,159 in a *kalpa*, instead of 600,000; and Áryabhaṭṭa has stated the limits of the libration at 24° instead of 27°.[3]

Bháskara himself, adopting the doctrine for which he quotes the authority of Munjála, in the passage above cited, mentions a complete revolution of the places of the colures through the twelve signs of the zodiac, at the rate of $59^{\text{II}}\ 54^{\text{III}}\ 2^{\text{IV}}\ 31^{\text{V}}\ 12^{\text{VI}}$ per annum, or 199,669 complete revolutions in a *kalpa*. Having computed, upon the same principle, the quantity of the pre-

[1] युगे षट्शतकृत्वा हि भचक्रं प्राक्विलम्बते ।
तद्गुणो भूदिनैर्भक्तो द्युगणो ऽयनखेचरः ॥

Soma-siddhánta.

तत्पश्चाच्चलितं चक्रम् इत्येतद्द्वेधं प्राक्चलनं युगे तानि च षट्शतम् ॥

S'ákalya-sanhitá, i. 286-291.

चन्द्राः खखर्तुभिर्भाज्यास्त्वहोस्त्रिघ्ना दशाहृता ॥

Laghu-vasishṭha-siddhánta, cited by Dádábháï and Nṛisinha on the *Súrya-siddhánta.*

[2] As. Res., vol. ii. p. 267. The commentator is Nṛisinha.

[3] चतुर्विंशत्यंशैश्चक्रमुभयतो गच्छेत् ॥

A'ryabhaṭṭa, in the A'ryáshṭaśata; quoted by Muníśwara. It is especially neces-

cession in his own time at $91{,}189^{\text{rev.}}\ 0^{\text{s}}\ 10^{\text{o}}\ 54^{\text{I}}\ 35^{\text{II}}\ 23^{\text{III}}\ 55^{\text{IIII}}\ 40^{\text{V}}\ 48^{\text{VI}}$, he thence, for the sake of facility in calculation, assumes in his practical treatise, named Karaṇa-kutúhala, the actual precession in whole numbers at eleven degrees, and allows the annual motion to be taken at one minute.[1] The time for which this [379] computation was made is the same with the epocha of the Karaṇa-kutúhala;[2] which is the year 1105 Śáka,[3] thirty-three years after the Śiromaṇi was completed.[4]

Bháskara's authority, supporting that of Munjála, and countenanced by Vishṇuchandra's,[5] has not availed with Indian astronomers. Even his commentator Muníśwara rejects the notion of a complete revolution; and, in his own treatise, entitled Siddhánta-sárvabhauma, asserts the doctrine of libration, and attempts to refute the other opinion, not indeed by argument, but in deference to the Súrya-siddhánta, and other authorities to which it is opposed. Upon the same ground, Kamalákara, in the Siddhánta-tattwaviveka, says, 'The

sary to distinguish the particular work of this author, to which reference is made: for Brahmagupta reproaches him for his inconsistency in affirming revolutions of the nodes in the Áryáshṭaśata, which he denied in the Daśa-gítaka. It is therefore probable that the libration of the equinoxes (considered as nodes), for which the first-mentioned work is quoted, may not be stated in the other.

[1] Muníśwara, in his commentary on the S'iromaṇi.

[2] The Graha-lághava, written in 1442 S'áka, deducts 444 from the expired years of the S'áka, and divides by sixty, reckoning the precession at a minute a year. This agrees nearly with the Karaṇa-kutúhala; for, if the same number (444) be deducted from the years expired (1105 S'áka), the remainder gives but one minute above 11°, the quantity there assumed by Bháskara.

Rámachandra, who in the Kála-nirṇaya states the quantity of precession as amounting to 12°, and reckons the precession at a minute of a degree a year, seems also to have followed the same authority. He may therefore have written about sixty years subsequent to the date of the Karaṇa-kutúhala; or S'áka 1165. This ascertainment of the age of Rámachandra-ácharya is a step towards investigating the age of writers in other branches of science who have quoted this author, or who are cited by him. They are numerous.

[3] Faizí, in his translation of Bháskara's Lílávatí.

[4] For it was finished when the author was thirty-six years of age; and he was born in 1036 S'áka: as he informs us.

[5] Author of the Vasishṭha-siddhánta, a distinct work from the Laghu-vasishṭha cited by Dádábháï, and (under the title of Vasishṭha-siddhánta) by Nṛisinha.

degrees of the colures, as stated by Munjála, and taught in the Śiromaṇi, contrary to what is declared by Arka (Súrya) and others, from not rightly understanding what was by them declared, [380] must be rejected by the wise.' He certainly here expresses the prevalent opinion of the Hindu astronomers, which is decidedly in favour of a libration of the places of the colures.

Besides Munjála mentioned by Bháskara, the only other ancient author, whose name I find quoted for a complete revolution of the equinoctial and solstitial points, is Vishṇu-chandra, from whose works a passage is cited by Pṛithúdaka-swámí, declaratory of a solstitial *yuga*, or period of the *ayana*. The text is corrupt in respect of the lowest digits of the number; and, having found no other quotation of it, I shall not attempt to state the period from a conjectural emendation of this passage.

It is necessary to observe that some of the ancient writers on astronomy have not admitted a periodical motion of the equinoxes. This is adverted to by Bháskara himself,[1] who instances Brahmagupta. The reason of that omission or denial is supposed by Bháskara[2] to have been the inconsiderable quantity of the deviation or precession, not then remarkable, and consequently unheeded by Brahmagupta; since whose time it is become sensible, and therefore it is now taken into account.[3] Bháskara next inquires 'why Brahmagupta and the rest did not [381] nevertheless state it on the strength of authority, since it had been declared in the Saura-siddhánta;

[1] In the Vásaná-bháshyá. [2] Ibid.

[3] तत्कथं ब्रह्मगुप्तादिभिर्निपुणैरपि नोक्त इति चेत् तदा स्वल्पत्वान्नोपलब्धः इदानीं बहुत्वात्सांप्रतैरुपलब्धः अत एवास्य गतिरस्तीत्यवगतम् ॥

'Why has it not been stated by Brahmagupta and other skilful astronomers? It was not perceived by them, because it was then inconsiderable. But it is perceived by the moderns, because it is now considerable. Accordingly it is concluded that there is motion [of the solstice].' Bháskara in the Vásaná-bháshya.

in like manner as the numbers of revolutions, the periphery of epicycles, etc.'[1]

He replies, 'In mathematical science holy tradition is authority so far only as it agrees with demonstration.' He goes on to say, 'Such motion as results from the assigned revolutions, by which places being calculated agree with those which are observed, must be admitted, whether taught by a holy sage or by a temporal teacher. If then the same places are deducible from other revolutions, which of the assigned motions is the true one? The answer is, whichever agrees with present observation must be admitted. But if in process of time the difference become great, then men of genius, like Brahmagupta, will arise, who will acknowledge such motions as agree with present observation, and compose books (*śástras*) conformable thereto. Accordingly, this mathematical science has no end in eternal time.'

But Brahmagupta's commentator, expounding a passage of this author,[2] which he considers to be levelled against those who affirmed a periodical revolution of the solstitial points, and which does deny such a revolution, and declares the solstice to be invariable, because the longest day and shortest night occur constantly at the end of Mithuna or Gemini, adverts, in the course of his exposition of the text, to passages which place the southern and northern solstice respectively in the middle of Áśleshá and beginning of Dhanishṭhá, and proceeds to remark, 'This [382] only proves a shifting of the solstice, not numerous revolutions of it through the ecliptic.' His notion appears, then, to have been, that his author was aware of the fact of a change in the positions of the solstitial and equinoctial points, but did not admit the inference that the motion must be periodical.

[1] यद्येवमनुपलब्धोऽपि सौरसिद्धान्तोक्तत्वादागमप्रामाण्येन भगणपरिध्यादिवत्कार्यं तेनोक्तः ।

[2] Ch. ii.

From all that has been said, it appears that some of the most celebrated astronomers, as Brahmagupta, have been silent on the subject of a change in the places of the colures, or have denied their regular periodical motion. That others, as Munjála and Bháskara (we may add Vishṇuchandra), have asserted a periodical revolution of the places of the colures. But that the greater number of celebrated writers, and all the modern Hindu astronomers, have affirmed a libration of the equinoctial points.

The earliest known author who is cited for the support of this doctrine, as far as present research has gone, is Árya-bhaṭṭa, who is undoubtedly more ancient than Brahmagupta; for he is repeatedly quoted in the Brahma-sphuṭa-siddhánta, which is ascribed to Brahmagupta, and which there is every reason to consider genuine, since the text of the book accords with the quotations from that celebrated astronomer to be found in treatises of various dates.

I purposely omit in this place the Súrya-siddhánta, Soma, Śákalya, Vasishṭha, and Páráśara, because their authenticity and age are subjects of question or of controversy.

Relying then upon the quotation from the work of Árya-bhaṭṭa, and on the tendency of Bháskara's observations, both in his text and notes, it may be inferred, that the notion of a libration of the equinoxes is of some antiquity in India; since Brahmagupta, by whom Áryabhaṭṭa is repeatedly mentioned, is either author or [383] republisher of an astronomical system which was copied by Bháskara in 1150 A.D., but which is adapted to a much earlier age.

The doctrine in question found advocates formerly among the astronomers of Europe and of Arabia. Arzael, a Spaniard, and a mathematician of the eleventh century,[1] author of a treatise entitled Observations on the Obliquity of the Zodiac,

[1] He observed the quantity of the obliquity of the ecliptic about the year 1070; and is named by Abraham ebn Ezra, who wrote in the twelfth century (A.D. 1144 or 1150), as anterior to him by seventy-one years. Riccioli, *Almag. nov.*

affirmed a libration or trepidation in longitude within the limits of 10° E. and W. at the rate of a degree in seventy-five years.[1] Two centuries after him, Thábit ben Korrah, an astrologer,[2] assigned to this supposed trepidation the limits of 22° E. and W.[3] To the same astrologer, by some supposed to have lived as much earlier, as he is here stated to have been later, a different doctrine is ascribed, affirming a motion of the intersected points of the ecliptic and equinoctial in a small circle described with the radius 4° 18′ 43″.[4]

They were led to that hypothesis (according to a remark quoted by the authors who have refuted the notion)[5] by considering that 'Hermes had found some of the fixed stars more distant from the beginning of Aries, than Ptolemy subsequently did: for instance the bright star of Hydra in 7° of Leo, placed by Ptolemy in 30° of Cancer; and the star named Vultur Cadens, in 24° of Sagittarius, but by Ptolemy in 17°.'

[384] The notion of a trepidation in longitude, but at a rate not equable, had been entertained by the astronomers who compiled the Alphonsine Tables, though Alphonsus himself was subsequently led to the adoption of a correcter opinion, and to the consequent alteration of the tables first published by him.[6]

The earliest mention of a libration in longitude, which has been found in any Arabic writer, is in the work of Muhammad ben Jabar, surnamed Albátaní, and by us called Albategnius. This celebrated astronomer, an Arabian by birth and Sabian by religion, flourished at the end of the ninth century;[7] or, to speak with precision, about the year

[1] Riccioli, *Almagestum novum*, 3, 28, 6.

[2] Moreri, *Dict.*

[3] Erasmus Reinhold on Purbach; Ricc. *Almag. nov.* 3, 28, 6.

[4] Montucla, *Hist. des Math.*, vol. i. p. 346.

[5] Augustinus Riccius, *de motu octavæ sphæræ.* Regiomontanus, *lib.* 7. *Epitomes Almagesti.* Ricc. *Alm. nov.* 3, 28, 6.

[6] Abraham Zacuthus, cited, like the preceding authorities, in Riccioli's *Almagest.*, 3, 28, 6.

[7] D'Herbelot, *Bibl. Orient.*

of Christ 879;[1] and from him we learn that certain astronomers, whom he does not appear to have anywhere named, had before him affirmed a libration of the fixed stars within the limits of 8° E. and W. at the rate of a degree in eighty or eighty-four years.[2] He himself maintained the doctrine of a uniform motion at the rate of a degree in sixty-six years.[3]

I have dwelt the longer upon the history of this opinion because it appears to me deserving of attention on more than one account. Albátaní is the earliest of the Arabian astronomers who improved upon Ptolemy (for Alfargání, who was a century earlier, is not cited as correcting the Greek astronomer on this point). It was he, then, who first among the astronomers of the west of Asia computed the motion of the stars at a degree in sixty-six years; which is almost the same with the rate of the motion of trepi[385]dation according to the Súrya-siddhánta, and the herd of Hindu astronomers, who reckon a degree and a half in a century.[4] He is the first also, as far as can be discovered, in whose works mention is made of a motion of trepidation, and we may be permitted to conjecture that the earlier astronomers alluded to by him were Indian; since we find Áryabhaṭṭa, an author seemingly of an earlier age, quoted for a libration of the equinoctial points within the limits of twenty-four degrees, at the rate of one in seventy-eight years; and since we know that an Arabian astronomer, anterior by nearly a century to Albátaní, had compiled tables in conformity to rules of astronomy apparently Indian.[5]

[1] He himself furnishes the date, being the year 1627 of the era of Nabonassar. Albategn. c. 51, cited in Riccioli's *Almagest.*, 6, 16, 2.

[2] Albategnius, c. 51, as cited by Riccioli. [3] *Ibid*, c. 51.

[4] This is the rate resulting from the quantity of the motion in trepidation stated in the Súrya-siddhánta: and the same results from the rules of calculation given in the Bháswatí-karaṇa of Satánanda and in the Játakárṇava improperly ascribed to Varáhamihira. They both direct the number 421 to be deducted from the expired years of S'áka; and the one deducts a tenth and reduces the remainder into degrees; the other adds half and divides by a hundred. Another rule, producing the same result, is mentioned in Bailly's *Astr. Ind.* p. 76.

[5] '*Ad regulas Send Hend.*' (*Siddhánt ?*) Abulfarag. *Hist. Dynast.*, pp. 114 and 161. Costard's *Astronomy*, p. 157, and Montucla, *Hist. des Math.*, vol. i. p. 344.

We may then safely conclude, that, on the subject of the precession of the equinoxes, the Hindus had a theory, which, though erroneous, was their own; and which, at a subsequent time, found advocates among the astronomers of the west. That they had a knowledge of the true doctrine of an uniform motion in antecedentia, at least seven hundred years ago,[1] when the astronomers of Europe also were divided on the question. That they had approximated [386] to the true rate of that motion much nearer than Ptolemy, before the Arabian astronomers, and as near the truth as these have ever done since. From this we may perhaps be led to a further conclusion, that the astronomy of the Hindus merits a more particular examination than it has yet obtained, not indeed with any expectation of advancing the science of astronomy, which needs not such aid, and can derive none from the labours of astronomers who have recorded no observations; but for the history of the science, and ascertainment of the progress which was here made: and that, with this view, the works of Hindu astronomers, whose age is precisely known, and in particular those of Bháskara, which contain a complete course of astronomy and of sciences connected with it, should be carefully perused; as well as those of Brahmagupta, which are full of quotations from earlier astronomers, as Áryabhaṭṭa,[2] Varáhamihira,[3] Śrísheṇa,[4] Vishṇuchandra,[5] and some others, who are cited by him for the purpose of exposing and correcting their errors.

In regard to Varáhamihira and the Súrya-siddhánta, both separately quoted in the Bráhma-sphuṭa-siddhánta of Brahmagupta, I may here remark that a book entitled Súrya-siddhánta is mentioned by Varáhamihira himself, in his most

[1] Bháskara, who quotes Munjála, completed the S'iromaṇi in 1072 S'áka, or A.D. 1150.

[2] Author of the Daśagítiká and A'ryáshṭa-śata.

[3] Named with censure by Brahmagupta.

[4] Author of the *Romaka-siddhánta*.

[5] Mentioned as the author of the *Vásishṭha-siddhánta*.

undoubted work, the treatise on Astrology, entitled Váráhí sanhitá, where, describing the qualifications requisite to form an accomplished astrologer, he says, 'The astrologer should be conversant with divisions of time and geometrical figures, as taught in the five Siddhántas, or [387] systems of astronomy, called Paulisa, Romaka, Vásishṭha, Saura, and Paitámaha.'[1]

Varáhamihira, as appears from the quotations of his own commentators Bhaṭṭotpala and many other astronomical writers, is likewise author of a treatise entitled *Pancha-siddhántiká*, in which the five systems above mentioned are compared; and, as far as can be gathered from quotations, their agreements and disagreements noticed. A passage of this treatise, as cited by Bhaṭṭotpala, is sufficiently remarkable to be here inserted, since it bears relation to the subject of this paper. It corresponds in import to a passage quoted by Mr. Davis, and Sir William Jones,[2] from the third chapter of the Váráhí sanhitá; but refers the actual position of the colures to the asterisms instead of the signs of the zodiac.

अश्लेषार्धादासीद्यदा निवृत्तिः किलोष्णकिरणस्य ।
युक्तमयनं तदासीत्सांप्रतमयनं पुनर्वसुतः ॥

'When the return of the sun took place from the middle of Áśleshá, the tropic was then right. It now takes place from Punarvasu.'

The same five systems of astronomy from which Varáha-mihira is understood to have compiled the astronomical treatise just now quoted, and which are named by him in [388]

[1] तत्र ग्रहगणिते पौलिशरोमकवासिष्ठसौरपैतामहेषु पञ्चस्वेतेषु सिद्धान्तेषु युगवर्षायनर्तुमासपक्षाहोरात्रयाममुहूर्तनाडीविनाडीप्राणत्रुटि-त्रुट्याद्यवयवस्य कालस्य क्षेत्रस्य च वेत्ता ॥

[For these five Siddhántas, cf. Reinaud's *Mémoire sur l'Inde*, p. 332 (*Mémoires de l'Académie des Inscript.* xviii. 1849). Albírúní positively states that the Pauliśa-siddhánta was attributed to Paulus the Greek, a native of Egypt. The only Siddhántas he could himself procure were those of Pauliśa and Brahmagupta (p. 334).]

[2] As. Res., vol. ii. p. 391.

the passage of his astrology before cited, are mentioned by Brahmagupta also as standard authorities, and enumerated by him in the same order: and his names, which are precisely the same with those in Varáhamihira's enumeration,[1] are explained by Bhaṭṭotpala, as intending the Puliśa-siddhánta, Romaka-siddhánta, Vasishṭha-siddhánta, Súrya-siddhánta, and Bráhma-siddhánta.

All these books are frequently cited in astronomical compilations, and are occasionally referred to their real or supposed authors. The first is everywhere assigned to Puliśa, whose name it bears. The Romaka-siddhánta is ascribed by the scholiast of Brahmagupta, and by a commentator of the Súrya-siddhánta, to Śríśena or Śríshena (for the name is variously written). The Vásishṭha-siddhánta is by the same authority given to Vishṇuchandra. Both these authors are repeatedly mentioned with censure by Brahmagupta; and it is acknowledged that they are entitled to no particular deference.

[389] The Bráhma-siddhánta, which is the basis of Brahmagupta's work, is not anywhere attributed to a known author; but referred in all quotations of it which have fallen under observation, either to the Vishṇu-dharmottara-puráṇa, of which it is considered as forming a part, or to Brahmá (also called Pitámaha), who is introduced into it as the speaker in a dialogue with Bhṛigu; or it is acknowledged to be the work

[1] पौलिशरोमकवासिष्ठसौरपैतामहेषु यत्प्रोक्तं तन्नक्षत्रानयनं नार्यभट्टोक्तं तदुक्तिरतः ॥

This passage, in which the Paulisha, Romaka, Vásishṭha, Saura, and Paitámaha are specified, is introductory to a division of the lunar asterisms (for astrological purposes, it should seem), in unequal portions, by allotting to fifteen of them a quantity equivalent to the mean diurnal motion of the moon in minutes of a degree (790′ 35″), and half as much more to six of those asterisms (1185′ 52″), and so much less to the like number of *nakshatras* (395′ 17″) and assigning the complement of the circle (254′ 18″) to the supplementary *nakshatra* called Abhijit.

(☞ The numbers here set down are copied from the scholiast Bhaṭṭotpala, and from Bháskara's commentators; being stated by them at the nearest second: for the moon's mean daily motion according to Brahmagupta and Bháskara is a little less than 790′ 35″.)

of some unknown person.[1] The true author it may be now impracticable to discover, and would be vain to conjecture.

The Súrya-siddhánta (if the same which we now possess) is in like manner ascribed to no certain author, unless in the passage cited by our colleague, Mr. Bentley,[2] who says, that 'in the commentary on the Bháswatí, it is declared that Varáha was the author of the Súrya-siddhánta;' and who adds, that 'Satánanda, the author of the Bháswatí, was a pupil of Varáha under whose directions he himself acknowledges he wrote that work.'

The concluding remark alludes to the following verse of the Bháswatí-karaṇa.

अथ प्रवक्ष्ये मिहिरोपदेशात् तत्सूर्यसिद्धान्तसमं समासात् ॥

'Next I will propound succinctly, from Mihira's instruction, [this system] equal to the Súrya-siddhánta.'

[390] It is preceded by an introductory couplet, which will be found quoted at the foot of the page,[3] or is omitted in some copies; but the correct reading, as appears from collation of text and scholia, retains both.

Admitting then its authenticity, and supposing, with most of the commentators, that Varáhamihira is here intended by the single word Mihira, which, however, is a name of the sun,

[1] Dádábhái, in his commentary on the Súrya-siddhánta, says so.

पैतामहमपि केनचिन्निबद्धं तस्योपरि ब्रह्मगुप्तेन पैतामहीभाष्ये निबद्धं तदपि पौरुषम् ॥

[2] As. Res., vol. vi. p. 572.

[3] नत्वा मुरारेश्चरणारविन्दं श्रीमान् शतानन्द इति प्रसिद्धः ।
तां भास्वतीं शिष्यहितार्थमाह शाके विहीने शशिपक्षखेके* ॥

'Having bowed to the foot of the foe of Mura, the fortunate Satánanda propounds, for the benefit of students, the Bháswatí, in the S'áka year 1021.'

The author Satánanda, as he himself informs us in the close of the book, was an inhabitant of Purushottama (the site of the temple of Jagannátha): and dates his work there in 4200 of the Kali yuga. In the body of the work he directs the difference of longitude to be reckoned from the meridian of Purushottama-kshetra.

* [-पक्ष- ?]

and may here allude to the fabled dialogue of Súrya with Maya, as is observed by the scholiast Balabhadra;[1] still the passage is not unambiguous. It does not necessarily imply oral tuition, and may refer to instruction derived from the works of Varáha; especially from the Pancha-siddhántiká of that author, in which the Súrya-siddhánta was explained concurrently with four other treatises termed Siddhánta.

To return from this digression. It appears from what had been before said, that a work bearing the title of Súrya-siddhánta is named as authority by Varáhamihira, in whose time, according to his assertion, the place of the [391] summer solstice was at the beginning of the sign Karkaṭa, and in the asterism Punarvasu. A treatise under the same title is similarly mentioned by Brahmagupta, who has likewise noticed Varáhamihira himself, and who is supposed by Bháskara to have lived when the colures had not sensibly deviated from that position.

It may be questioned whether this testimony be not overthrown by proofs of a more modern date (between seven and eight hundred years ago), drawn from internal evidence, as set forth by Mr. Bentley, in his ingenious essays inserted in the sixth and eighth volumes of our Researches.[2]

Without entering at present into any disquisition on this subject, or discussing the accuracy of the premises; but acceding generally to the position, that the date of a set of astronomical tables, or of a system for the computation of the places of planets, is deducible from the ascertainment of a time when that system or set of tables gave results nearest to the truth; and granting that the date above mentioned approximates within certain limits to such an ascertainment; I shall merely observe, that supposing the dates otherwise irreconcileable, still the book which we now have under the name of

[1] His commentary is dated in 1465 of Vikramáditya; more than 400 years ago. [This is not the Balabhadra quoted by Albírúní, cf. Reinaud, *Mém. sur l'Inde*, p. 335.]

[2] As. Res., vol. vi. p. 572, and vol. viii. p. 206.

Súrya; or Saura, siddhánta, may have been, and probably was, modernized from a more ancient treatise of the same name, the later work borrowing its title from an earlier performance of a different author. We have an instance of this practice in the kindred case of the Bráhma-siddhánta; for we are acquainted with no less than three astronomical treatises bearing this title; one extracted from the Vishṇu-dharmottara; another termed the Śákalya; and the third the Sphuṭa-siddhánta of Brahmagupta: and an equal number of tracts entitled Vásishṭha-siddhánta may be [392] traced in the quotations of authors; one by Vishṇuchandra; another termed Laghu-vásishṭha, which from its name should be an abridgment; and the third, apparently an ample treatise, distinguished as the Vṛiddha-vásishṭha. This solution of the objection also is entirely compatible with the tenor of the references to the Saura, which have been yet remarked in the works of Brahmagupta and Varáhamihira; none of them being relative to points that furnish arguments for concluding the age of the book from internal evidence.

At all events, whatever may be thought of the Súrya-siddhánta, we have the authority of a quotation from Ấryabhaṭṭa, to show that the Hindus had ascertained the quantity of the precession more correctly than Ptolemy; and had accounted for it by a motion in libration or trepidation, before this notion was adopted by any other astronomer whose labours are known to us.

It appears also from a passage of Brahmagupta's refutation of the supposed errors of that author, and from his commentator's quotation of Ấryabhaṭṭa's text, that this ancient astronomer maintained the doctrine of the earth's diurnal revolution round its axis. 'The sphere of the stars,' he affirms, 'is stationary; and the earth, making a revolution, produces the daily rising and setting of stars and planets.'[1]

[1] भपञ्जरः स्थिरो भूरेवावृत्यावृत्य प्रातिदैवसिकौ उदयास्तमयौ संपादयति नक्षत्रग्रहाणाम् । Ấryabhaṭṭa cited by Pṛithúdaka.

Brahmagupta answers, 'If the earth move a minute in a *práṇa*, then whence and what route does it proceed? If it revolve, why do not lofty objects fall?'[1] But his commentator, Pṛithúdaka-swámí, re[393]plies, 'A'ryabhaṭṭa's opinion appears nevertheless satisfactory; since planets cannot have two motions at once: and the objection, that lofty things would fall, is contradicted; for, every way, the under part of the earth is also the upper; since, wherever the spectator stands on the earth's surface, even that spot is the uppermost point.'

We here find both an ancient astronomer and a later commentator[2] maintaining, against the sense of their countrymen, the rational doctrine which Heraclides of Pontus, the Pythagorean Ecphantus, and a few others among the Greeks, had affirmed of old, but which was abandoned by the astronomers both of the east and of the west, until revived and demonstrated in comparatively modern times.[3]

Brahmagupta is more fortunate in his reasoning where he refutes another theory of the alternation of day and night imagined by the Jainas, who account for the diurnal change by the passage of two suns, and as many moons, and a double set of stars and minor planets, round a pyramidical mountain, at the foot of which is this habitable earth. His confutation of that absurdity is copied by Bháskara, who has added to it from Pṛithúdaka's gloss on a different passage of Brahmagupta, a refutation of another notion ascribed by him to the same sect, respecting the translation of the earth in space.

This idea has no other origin than the notion, that the earth, being heavy and without support, must perpetually

[1] प्राणेनैति कलां भूर्यदि तत्कुतो व्रजेत्कमध्वानम् । आवर्तनमुर्व्या-श्चेन्न पतन्ति समुच्छ्रायाः कस्मात् ॥ *Bráhma-sphuṭa-siddhánta.*

[2] The commentator wrote at least seven centuries ago; for he is quoted by Bháskara in the text and notes of the S'iromaṇi.

[3] For an outline of A'ryabhaṭṭa's system of astronomy, see a note at the close of this Essay, p. [414].

descend: and has, therefore, no relation whatever to the modern opinion of a proper motion of the sun and stars.

[394] Part of the passage of Bháskara has been quoted in a former essay.[1] What regards the further subject now noticed is here subjoined.

'The earth stands firm, by its own power, without other support in space.

'If there be a material support to the earth, and another upholder of that, and again another of this, and so on, there is no limit. If finally self-support must be assumed, why not assume it in the first instance? why not recognize it in this multiform earth?

'As heat is in the sun and fire, coldness in the moon, fluidity in water, hardness in iron; so mobility is in air; and immobility in the earth, by nature. How wonderful are the implanted faculties!

'The earth, possessing an attractive force,[2] draws towards itself any heavy substance situated in the surrounding atmosphere, and that substance appears as if it fell. But whither can the earth fall in ethereal space which is equal and alike on every side?

'Observing the revolution of the stars, the Bauddhas[3] acknowledge, that the earth has no support; but as nothing heavy is seen to remain in the atmosphere, they thence conclude that it falls in ethereal space.

'Whence dost thou deduce, O Bauddha, this idle notion, that, because any heavy substance thrown into the air, falls to the earth, therefore the earth itself descends?'[4]

He adds this further explanation in his notes: 'For if the earth were falling, an arrow shot into the air would not return to it when the projectile force was expended, since [395] both

[1] As. Res., vol. ix. p. 322 [p. 201 of the present volume].

[2] Like the attraction of the loadstone for iron. Máríchi on Bháskara.

[3] Meaning the Jainas; as appears from the author's own annotation on this passage.

[4] S'iromaṇi, Goládhyáya, c. i. v. 2, 4, 7 and 9.

would descend. Nor can it be said that it moves slower, and is overtaken by the arrow; for heaviest bodies fall quickest, and the earth is heaviest.'

It has been observed in a former part of this essay, that Brahmagupta's treatise of astronomy is founded on an anterior one entitled Bráhma-siddhánta; and the authenticity of the book extant under Brahmagupta's name has been relied upon, and passages have been freely cited from it, as the genuine performance of that ancient astronomer. These matters appear to be of sufficient importance to deserve a more particular explanation of their grounds.

The source from which Brahmagupta drew, is indicated by the author himself, in his introductory couplet, cited by Lakshmídása in the commentary on Bháskara:[1]

ब्रह्मोक्तग्रहगणितं महता कालेन यत्खिलीभूतम् ।
अभिधीयते स्फुटं तत् जिष्णुसुतब्रह्मगुप्तेन ॥

which, in a literal version, will stand thus:—'The computation of planets, as declared by Brahmá, and become imperfect by great length of time, is perspicuously (*sphuṭa*) explained by Brahmagupta, son of Jishṇu.'

The ambiguity imputable to this passage is obviated by the more explicit terms of the initial stanza of his eleventh chapter, where Brahmagupta announces a refutation of opinions opposed to the Bráhma-siddhánta:

ये ऽज्ञानपटलबहुलदृशो ऽन्यद्ब्राह्माद्वदन्ति सिद्धान्तात् । तेषां युगादिभे-
दाद्ये दोषास्तान्प्रवक्ष्यामि ॥

[396] 'I will refute the errors (respecting the *yugas* and other matters) of those who, misled by ignorance, maintain things contrary to the Bráhma-siddhánta.'

What the work is, to which Brahmagupta refers under the title specified by him, and corresponding to a subsequent mention by him of the Paitámaha-siddhánta (both titles being

[1] The Gaṇita-tattwa-chintámaṇi, dated in 1423 S'áka, or 1501 A.D.

of the same import), is explained by the scholiasts of Bháskara and of the Súrya-siddhánta. Nṛisinha, a commentator on both texts,[1] affirms that Brahmagupta's rules are formed from the Vishṇu-dharmottara-puráṇa, in which the Bráhma-siddhánta is contained;[2] Bháskara's commentator, Muníśwara,[3] remarks, that Brahmagupta, having verified by observation the revolutions stated in the Bráhma-siddhánta of the Vishṇu-dharmottara, and having found them suitable to his own time, adopted these numbers, rejecting the revolutions taught by Súrya and the rest. In other places the commentator cites parallel passages from Brahmagupta and the Bráhma- (also termed by him Paitámaha-) siddhánta of the Vishṇu-dharmottara:[4] and these with numerous [397] quotations from

[1] He is the author of a commentary on the Súrya-siddhánta, and of the Vásaná-várttika on Bháskara's text and notes. It is dated in 1543 S'áka, or 1621 A.D.

[2] As. Res., vol. ii. p. 242.

[3] Author of the Márichi on Bháskara's S'iromaṇi, and of a distinct treatise of astronomy, the Siddhánta-sárvabhauma. The earliest copy of the Márichi is dated 1560 S'áka (A.D. 1638), which is not much later than the date of the work itself; for the Emperor Núruddín Jahángír is mentioned at the close of the book, as he also is in the preface of a commentary on the Súrya-siddhánta by the author's father Ranganátha.

[4] Take the following as examples:

1st. The number of sidereal days in a *kalpa* (viz. 1,582,236,450,000), which the Paitámaha-siddhánta of the Vishṇu-dharmottara (cited in Márichi, ch. i.) expresses by these words:

चत्वारि शून्यानि पञ्चवेदरसाग्नियमपक्षाष्टशरेन्दवः कल्पेन प्रति नक्षत्रोदयाः ॥

and Brahmagupta renders by the equivalent terms,

परिवर्ता खचतुष्टयशराब्धिरसगुणयमद्विवसुतिथयः ॥

2nd. The commencement of the *kalpa*, on Sunday, 1st Chaitra, at the moment of sunrise on the meridian of Lanká, which the Bráhma-siddhánta of the Vishṇu-dharmottara-puráṇa (Márichi, ch. ii.) thus expresses:

लङ्कायामर्कोदये चैत्रशुक्लप्रतिपदारब्धेऽर्कदिनादावश्विन्यादौ विष्कु-
म्भादौ रौद्रादौ काले प्रवृत्तिः ।

and Brahmagupta by the following couplet,

चैत्रसितादेरुदयाद्भानोर्दिनमासवर्षयुगकल्पाः ।
सृष्ट्यादौ लङ्कायां समं प्रवृत्ता दिनेऽर्कस्य ॥

Brahmagupta in the Chintámaṇi and in other commentaries on Bháskara, as well as in the author's notes on his own text, are exactly conformable with the Bráhma-sphuṭa-siddhánta now in my possession, and which is accompanied by the gloss of Brahmagupta's celebrated commentator Chaturveda-pṛithú-daka-swámí.

It appears, then, from a collation of the passages so cited, that Brahmagupta's work is, at least in part, a paraphrase of the Bráhma or Paitámaha; containing, how[398]ever, additional matter: and it is accordingly termed by one of the scholiasts of the Súrya-siddhanta[1] a commentary on the Paitámaha; and Chaturveda's gloss is denominated by the same scholiast an interpretation of the Paitámaha-bháshya.

In support of what has been here said, I shall adduce a few instances of quotation on subjects possessing some degree of interest.

The first is one in which Bháskara vindicates a passage of Brahmagupta from the objections of his commentator, quoting the passage itself in his notes, and there naming the scholiast, Chaturveda; from which, be it remarked, the commentary is ascertained to be anterior to Bháskara's work: I have a further reason, however, for citing the passage, as it furnishes occasion for some observations on the Indian theory of astronomy.

The Hindus, as is well known, place the earth in the centre of the world, and make the Sun and Moon and minor planets revolve round it, apparently in concentric orbits, with unequal or irregular motion. For a physical explanation of the phenomena, they imagine the planets driven by currents of air along their respective orbits (besides one great vortex carrying stars and planets with prodigious velocity, round the earth, in the compass of a day). The winds or currents, impelling the several planets, communicate to them velocities, by which their motion should be equable and in the plane of the ecliptic; but the planets are drawn from this course by certain

[1] Dádábhái.

controlling powers, situated at the apogees, conjunctions, and nodes.

These powers are clothed by Hindu imaginations with celestial bodies invisible to human sight, and furnished with hands and reins, by which they draw the planets from their [399] direct path and uniform progress. The being at the apogee, for instance, constantly attracts the planet towards itself, alternately, however, with the right and left hands. The deity of the node diverts the planet, first to one side, then to the other, from the ecliptic. And, lastly, the deity at the conjunction causes the planet to be one while stationary, another while retrograde, and to move at different times with velocity accelerated or retarded. These fancied beings are considered as invisible planets; the nodes and apogees having a motion of their own in the ecliptic.

This whimsical system, more worthy of the mythologist than of the astronomer, is gravely set forth in the Súrya-siddhánta; and even Bháskara gives in to it, though not without indications of reluctant acquiescence: for he has not noticed it in his text, and only briefly in his notes.

To explain on mathematical principles the irregularity of the planetary motions, the Hindu astronomers remove the earth from the centre of the planet's orbit, and assume the motion in that excentric to be really equable, though it appear irregular as viewed from the earth. Another hypothesis is also taught by them; according to which the planet revolves with an equal but contrary motion in an epicycle, of which the centre is carried with like but direct motion on a concentric orbit.

Bháskara remarks that both theories are equivalent, giving the same results in computation; but he maintains that the planet's motion in an excentric orbit (*pratimaṇḍala*) is consonant to the truth, and the other hypothesis of an epicycle (*nichochcha vṛitta*) is merely a device for the facility of computation.

Both theories, with certain modifications, which will be subsequently noticed, suffice for the anomaly of the Sun and Moon. To account for the still greater apparent irre[400]gularities of the five minor planets, the Hindu astronomers make them revolve with direct motion on an epicycle borne on an excentric deferent. (In the case of the two inferior planets, the revolution in the excentric is performed in the same time with the Sun: consequently the planet's motion in its epicycle is in fact its proper revolution in its orbit. In the instance of the superior planets, on the contrary, the epicycle corresponds in time to a revolution of the Sun, and the excentric deferent answers to the true revolution of the planet in its orbit.)

So far the Indian system, as already remarked by Mr. Davis in his treatise on the astronomical computations of the Hindus,[1] agrees with the Ptolemaic. At the first glance it will remind the reader of the hypothesis of an excentric orbit devised by Hipparchus, and of that of an epicycle on a deferent, said to have been invented by Apollonius, but applied by Hipparchus. At the same time the omission of an equant (having double the excentricity of the deferent) imagined by Ptolemy for the five minor planets, as well as the epicycle with a deferent of the centre of the excentric, contrived by him to account for the evection of the Moon, and the circle of anomaly of excentricity, adapted to the inequality of Mercury's motions, cannot fail to attract notice.

The Hindus, who have not any of Ptolemy's additions to the theory of Hipparchus, have introduced a different modification of the hypothesis, for they give an oval form to the excentric or equivalent epicycle, as well as to the planet's proper epicycle. That is, they assume the axis of the epicycle greater at the end of the (*sama*) even quadrants of anomaly (or in the line of the apsides and conjunctions), and least at the end of the (*vishama*) odd [401] quadrants (first and third),

[1] As. Res., vol. ii., p. 250.

and intermediately in proportion.[1] This contrivance of an oval epicycle is applied by certain astronomers to all the planets; and by others is restricted to few; and by some is altogether rejected. Áryabhaṭṭa, for example, and the Súrya-siddhánta, make both epicyles of all the planets oval, placing however the short axis of the proper epicycles of Jupiter and Saturn in the line of mean conjunction, termed by Hindu astronomers their quick apogee (*śíghrochcha*). Brahmagupta and Bháskara, on the contrary, acknowledge only the epicycles of Mars and Venus to be oval, and insist that the rest are circular. The author of the Siddhánta-sárvabhauma goes a step further, maintaining that all are circular, and taking the mean between the numbers given in the Surya-siddhánta.

[1] Rad : Sine of anomaly : : Diff. between circles described on greatest and least axis : Diff. between circles described on greatest axis and on the diameter of the epicycle for the proposed anomaly. Whence the circle described on that diameter is determined; and is used for the epicycle in computations for that anomaly. Since circles are to each other as their radii, the proportion above stated answers to the following; semitransverse axis : diff. between transverse and conjugate semiaxis : : ordinate of the circle : a fourth proportional; which is precisely the difference between that ordinate and an ordinate of the ellipse for the same abscies. Hindu astronomers take it for the difference between the radius of the circumscribed circle and the semidiameter of the ellipse at an angle with the axis equal to the proposed anomaly; and, in an ellipsis very little excentric, the error is small.

[402] DIMENSIONS OF THE EPICYCLES IN DEGREES OF THE DEFERENT.

		☉	☾	♂	☿	♃	♀	♄
Epicycle of anomaly......	Brahmagupta ...	13° 40′	31° 36′	70° ± 6° 40′*	38° 0′	33° 0′	11° & 9°†	30° 0′
	Bháskara.........	—	—	— —	—	—	—	50 0
Circle described on the great axis of the oval epicycle	Súrya-siddhánta.	14 0	32 0	75 0 —	30 0	33 0	12	49 0
Circle described on the less axis	....	13 40	31 40	72 0 —	28 0	32 0	11	48 0
Proper epicycle	Brahmagupta ...	—	—	243 40±6 40*	132 0	68 0	258 & 263†	40 0
Circle on the great axis of the oval epicycle...	(Súrya-siddhánta)	—	—	235 0 —	133 0	72 0	262	40 0
Circle on the less axis ..	....	—	—	232 0 —	132 0	70 0	260	39 0

* The epicycles of Mars, according to Brahmagupta and Bháskara, are increased in six signs and diminished in six other signs of anomaly, by a quantity found by this proportion; sine of 45°: sine or cosine of anomaly (whichever be the least) : : 6° 40′: correction additive in six first signs, and subtractive in six last.

† The epicycles of Venus are oval, and the circles described on the transverse and conjugate axis (circles circumscribed and inscribed) are here stated.

[403] A further difference of theory, though not of practice, occurs among the Hindu astronomers, in regard to the curvature of the excentric deferents, and the consequent method of computing on the equivalent hypothesis of epicycles.

A reference to Mr. Davis's Essay,[1] and to the diagrams which accompany it, will render intelligible what has been already said, and what now remains to be explained. It is there observed, that it is only in computing the retrogradations, and other particulars respecting the minor planets, that the Hindus find the length of the *karṇa* Є ⊕[2] (or line drawn from the centre of the earth to the planet's place in the epicycle). In other cases, as for the anomalistic equation of the Sun and Moon, they are satisfied to take *hc* as equal to the sine *lm*[3] (that is, the sine of mean anomaly, reduced to its dimensions in the epicycle in parts of the radius of the concentric, equal to the sine of the anomalistic equation). The reason is subjoined: 'The difference, as the commentator on the Súrya-siddhánta observes, being inconsiderable.'

Most of the commentators on the Súrya-siddhánta do assign that reason; but some of them adopt Brahmagupta's explanation. This astronomer maintains that the operation of finding the *karṇa* is rightly omitted in respect of the excentrics or equivalent epicycles of all the planets, and retained in regard to the proper epicycles of the minor planets carried by the excentric deferents. His hypothesis, as briefly intimated by himself, and as explained by Bháskara, supposes the epicycle, which represents the excentric, to be augmented in the proportion [404] which *karṇa* (or the distance of the planet's place from the earth's centre) bears to the radius of the concentric; and it is on this account, and not as a mere approximation, that the finding of the *karṇa*, with the subsequent operation to which it is applicable, is dispensed with.[4]

[1] As. Res., vol. ii. p. 249.

[2] As. Res., vol ii. p. 250. Diagram, fig. 2. [3] *Ibid.*

[4] For Rad : periphery of the epicycle : : *karṇa* : augmented epicycle. And circle : sine of anomaly : : augmented epicycle : sine of anomaly in augmented epicycle.

The scholiast of Brahmagupta objects to his author's doctrine on this point, that, upon the same principle, the process of finding the *karṇa*, with the subsequent employment of it to find the sine of the anomalistic equation, should in like manner be omitted in the proper epicycle of the five minor planets; and he concludes therefore that the omission of that process has no other ground but the very inconsiderable difference of the result in the instance of a small epicycle. For, as remarked by another author,[1] treating on the same subject, the equation itself and its sine are very small near the line of the apsides; and at a distance from that line the *karṇa* and radius approach to equality.

Bháskara, in the Śiromaṇi, quotes succinctly Brahmagupta's doctrine, and the scholiast's objection to it; and replies to the latter: and in his notes in the Vásaná-bháshya, cites the text of Brahmagupta and Chaturveda's reasoning, which he tries to confute. His quotation agrees perfectly with the present text of the Bráhma-[405]sphuṭa-siddhánta and commentary of Chaturveda-pṛithúdaka-swámí, which is annexed to it.

The passage, which has required so much preparatory explanation, is itself short:

त्रिज्याभक्तः कर्णः परिधिगुणो बाहुकोटिगुणकारः ।
चलकर्मवन्मन्दे तत्फलमाद्यसमं नात्र कर्णो ऽस्मात् ॥

'The *karṇa*, or longest side of the triangle, multiplied by the periphery of the epicycle and divided by radius, becomes the multiplier of the sine and cosine of anomaly. The same result, as before, is obtained by a single operation in the instance of the anomalistic epicycle: and therefore *karṇa* is not here employed.'

Lastly, *karṇa* : sine of anomaly in augmented epicycle : : radius : sine of anomalistic equation.

Whence periphery $\times \frac{\text{Karṇa}}{\text{Radius}} \times \frac{\text{Radius}}{\text{Karṇa}} \times \frac{\text{Sine of Anomaly}}{\text{Circle}} =$ sine of anomalistic equation.

And, abridging, periphery $\times \frac{\text{Sine of Anomaly}}{\text{Circle}} =$ sine of anomalistic equation.

[1] In the Máríchi.

Bháskara's words in the Śiromaṇi are these: 'Some say that in this system, in the operation of finding the equation of anomaly, the *karṇa* or long side of the triangle is not employed, because the difference in the two modes of computation is very inconsiderable. But others maintain that, if the *karṇa* be used, the periphery of the epicycle must in this operation be corrected, by multiplying it by *karṇa* and dividing by radius. Wherefore the result is the same as by the former method: and on that account, they say, the *karṇa* is not employed. It is not to be objected, why is not the same method used in the *śighra* epicycle? For the principles of the two differ.'

In his notes on this part of his text, he cites, as before observed, the precise passage of Brahmagupta which has been inserted above, and a portion of Chaturveda's comment on it, and names the author.

In another instance Bháskara quotes in his Śiromaṇi Brahmagupta by name, and the commentator by implication (and fuller quotations of both occur in the notes and commentaries), for a disagreement in regard to the latitude [406] of stars and planets measured from the ecliptic both on a circle drawn through its poles, and on one passing through the poles of the equator; the latter termed *sphuṭa* or apparent, and the other *asphuṭa* or unapparent.[1] Bháskara remarks that Brahmagupta has directed the latitudes of planets to be computed by one mode, and has given those of the stars in the other, but has stated no rule for reducing the latitude of one denomination to the other, or for rectifying the true latitude from the measure given on the circle of declination. The reason he considers to be the little difference between them (which is true in respect of the planets, though not so in the case of most of the stars), and the frequent occasion in astronomical computations, for the declination of stars, while

[1] *Asphuṭa sara* is the true latitude of a star or planet; *sphuṭa sara* is its declination $\pm$ declination of the point of intersection in the ecliptic.

their proper latitude is not an element in any calculation; whereas, in the case of the planets, both are employed on different occasions: he adverts to a strained interpretation proposed by the commentator to construe Brahmagupta's rule as adapted to the same denomination of latitude which is employed by him for the stars. Bháskara refutes that interpretation, and justifies Brahmagupta's text taken in its obvious and natural sense.

This passage of the Siromaṇi[1] confirms what was said [407] by me, from other authority, in a former essay,[2] concerning the Hindu method of determining a star's place with reference to the ecliptic, by the intersection of a circle of declination, and by taking the latitude and longitude of the star to that point of intersection, instead of employing a perpendicular to the ecliptic.

The only other passage to which I shall draw the reader's attention is one of considerable length, in which Brahmagupta, although he has rightly given the theory of solar and lunar eclipses, with the astronomical principles on which they are to be computed, affirms, in compliance with the prejudices of Hindu bigots, the existence of Ráhu as an eighth planet and as the immediate cause of eclipses, and reprehends Varáhamihira, Áryabhaṭṭa, Śrísheṇa and Vishṇuchandra for rejecting this orthodox explanation of the phenomenon. The passage is quoted by Bháskara's commentator in the Chintámaṇi on the occasion of a more concise text of the Śiromaṇi affirming the agency of Ráhu in eclipses.[3]

1 ब्रह्मगुप्तादिभिः स्वल्पान्तरत्वान्न कृतः स्फुटः ।
स्थित्यर्धपरिलेखादौ गणितागत एव हि ॥
नक्षत्राणां स्फुटा एव स्थिरत्वात्पठिताः शराः ।
दृक्कर्मणायनेनैषां संस्कृताश्च तथा ध्रुवाः ॥ etc.

Goládhyáya, c. viii. v. 11, etc.

2 As. Res., vol. ix. [p. 284, etc., of the present volume].

3 Part 2, ch. vii. v. 10.

This quotation from the Bráhma-siddhánta, comprising seven couplets in the Chintámaṇi, has been verified in the text of the Bráhma-sphuṭa-siddhánta of Brahmagupta.[1]

All these, with numerous other instances in the annotations and commentaries of the Śiromaṇi, which I refrain from adducing, lest the reader's patience should be tired, have established to my entire conviction the genuineness of the Sphuṭa-siddhánta founded on a prior treatise entitled Bráhma-siddhánta.

I am not unapprised that, under a feeling of great distrust or unwillingness to admit the conclusions which follow from this position, a variety of hypotheses might be formed [408] to a different effect. Brahmagupta, supposing him to be entirely an original writer, may have referred to an imaginary work to give that kind of authority to his performance which the Hindus most fancy; or he may have fathered on a *puráṇa* a synopsis of his own doctrine for the same purpose; or some other writer, from whatever motive, may have fabricated a pretended extract of a *puráṇa* containing the heads of Brahmagupta's system, and have given currency to it on the strength of the reference in that astronomer's treatise to an anterior work. These and other suppositions grounded on surmise of fraud and forgery may be formed. I shall not discuss them: for I have no concern but with the facts themselves. Bháskara, writing 650 years ago, declares, and so do all his commentators, that he has followed Brahmagupta as his guide. They quote numerous passages from his work; and Bháskara affirms that Brahmagupta took the number of revolutions assigned to the planets in the great period termed *kalpa* from an earlier authority. The commentators, who wrote from two to four centuries ago, assert that those numbers were taken from a treatise in form of dialogue between Bhagavat (or Brahmá) and Bhṛigu, inserted in the Vishṇu-dharmottara-puráṇa, and distinguished

[1] *Goládhyáya.*

by the title of Bráhma or Paitámaha-siddhánta. They cite parallel passages, which do in fact exactly accord in sense and import. They occasionally quote observations on Brahmagupta by his scholiast Chaturveda-prithúdaka-swámí. A book is extant (a copy, partly deficient, however, having come into my possession with other astronomical collections), and which consists of a text under the title of Bráhma-sphuṭa-siddhánta, accompanied by a continual commentary by Chaturveda-prithúdaka-swámí. The text contains the same astronomical doctrine which Bháskara teaches, and which he professes to have derived [409] from Brahmagupta; and passages quoted by him in his text, or at more length in his notes, or by his commentators, or by other astronomical writers, as the words of Brahmagupta, are found verbatim in it. I consider it therefore as the genuine text of the treatise used by Bháskara, as Brahmagupta's; and seeing no reason for suspicion and distrust, I quote it as the authentic work of that celebrated astronomer.

As the evidence which has been here collected with reference to particular points, bears also upon other questions, I shall now state further conclusions, regarding the history of Indian astronomy, which appear to me to be justly deducible from the premises. Those conclusions will be supported, when necessary, by additional references to authorities.

Brahmagupta and Varáhamihira, though named at the head of astronomers by Bháskara and Satánanda and by the herd of later writers, are not to be considered as the authors of the Indian system of astronomy. They abound in quotations from more ancient astronomers, upon whose works their own are confessedly grounded. In addition to the names before mentioned,[1] those of Pradyumna, Lála-sinha, and Láḍháchárya, may be here specified. But the Bráhma-siddhánta and the works of Áryabhaṭṭa are what principally engages Brahmagupta's attention: and the five Siddhántas have been the

[1] Page [386].

particular subject of Varáhamihira's labours. He appears to have been anterior to Brahmagupta, being actually cited by him among other writers, whose errors are exposed and corrected.

Varáhamihira, constantly quoted as the author of the Váráhí sanhitá and Pancha-siddhántiká, must be [410] judged from those works, which are undoubtedly his by the unanimous consent of the learned, and by the testimony of the ancient scholiast Bhaṭṭotpala. The minor works, ascribed to the same author, may have been composed in later times, and the name of a celebrated author have been affixed to them, according to a practice, which is but too common in India as in many other countries. The Jáṭakárṇava, for example, which has been attributed to him, may not improbably be the work of a different author. At least, I am not apprised of any collateral evidence (such as quotations from it in books of some antiquity) to support its genuineness, as a work of Varáhamihira's.

In the Váráhí sanhitá, this author has not followed the system which is taught in the Súrya-siddhánta. For instance, his rule for finding the year of the cycle of sixty years, founded on the mean motions of Jupiter, shows that he employed a different number from that which the Súrya-siddhánta furnishes, *viz.* 364,224 revolutions in a *yuga*, instead of 364,200; and it appears from a quotation of the scholiast that Áryabhaṭṭa is the authority for that number of revolutions of Jupiter.

Before the age of Varáhamihira and Brahmagupta, and subsequently to that of Garga,[1] a number of illustrious astronomers flourished, by whom the science was cultivated

[1] [For an account of the Gárgí Sanhitá, cf. Kern's *Bṛihat Sanhitá*, Introd. pp. 33-40; Aufrecht's *Cat. of MSS. in Trinity Coll. Library*, pp. 32-36. Dr. Kern quotes a passage which describes an invasion of the Yavanas as far as Sáketa (Ayodhyá) and Pushpapura (Palibothra), and the subsequent tyranny of a Scythian king. He fixes the date of the work approximately as B.C. 50. His MS. is incomplete; but the only Greek word which occurs in that portion is *hord*, and no mention is made of the signs of the zodiac.]

and promoted, but whose works unhappily are lost, or at least have not been yet recovered, and are at present known to us only by quotation. No less than ten intermediate writers are cited by Brahmagupta; of whom five at the least are noticed by Varáhamihira.[1]

The proficiency of the Yavanas in astronomy was known to Varáhamihira. He has mentioned it with applause,[2] [411] and has more than once referred to the authority of their writers. The name of Yavanáchárya, which occurs frequently in the compilations of Hindu astronomers,[3] has apparently reference to an author of that nation; which is characterized by Varáhamihira as a people of Mlechhas, or barbarians. The title of Romaka-siddhánta, given by Śrísheṇa to his astronomical treatise, which is quoted under this title by Varáhamihira and Brahmagupta, may be presumed also to carry some allusion to the system of the astronomers of the West.

If these circumstances, joined to a resemblance hardly to be supposed casual, which the Hindu astronomy, with its apparatus of excentrics and epicycles, bears in many respects to that of the Greeks, be thought to authorize a belief that the Hindus received from the Greeks that knowledge which enabled them to correct and improve their own imperfect astronomy, I shall not be inclined to dissent from the opinion.[4] There does indeed appear ground for more than a conjecture that the Hindus had obtained a knowledge of Grecian astronomy before the Arabs began to cultivate the science; and

[1] See before pp. [386], [388], and [409].

[2] म्लेच्छा हि यवनास्तेषु सम्यक्शास्त्रमिदं स्थितम् ।
ऋषिवत्तेऽपि पूज्यन्ते किं पुनर्दैवविद्द्विजः ॥

'For the Yavanas are barbarians; but this science is well established among them; and they are revered like holy sages: much more shall a priest who is learned in it be venerated.' [This passage from Varáhamihira is quoted by Albírúní (Reinaud's *Mémoire*, p. 333). These lines really occur in the Gárgí Sanhitá, see Kern's *Bṛihat Sanhitá*, Introd. p. 35.]

[3] As. Res., vol. ix. p. 376 (see pp. 321 and 323, of the present volume).

[4] [Cf. Prof. Whitney's note to Burgess's *Transl. Súrya-siddhánta*, pp. 327–331.]

that the whole cluster of astronomers mentioned by Brahmagupta must be placed in the interval between the age of Hipparchus, and possibly that of Ptolemy, and the date of Brahmagupta's revision of the Bráhma-siddhánta.

In reforming the Indian astronomy, Brahmagupta and the astronomers who preceded him did not take implicitly the mean motions of the planets given by the Gre[412]cian astronomer. In general they are wider from the truth than Ptolemy.[1] But in the instance which is the subject of this paper they made a nearer approach to accuracy than he had done, and

[1] MEAN DIURNAL MOTIONS OF THE PLANETS.

[Cf. Burgess, *Transl. Súrya-siddhánta*, pp. 24, 282.]

	Brahmagupta.					Súrya-siddhánta.					Ptolemy.					Lalande.				
	°	′	″	‴	⁗	°	′	″	‴	⁗	°	′	″	‴	⁗	°	′	″	‴	⁗
☉	0	59	8	10	22	0	59	8	10	10	0	59	8	17	13	0	59	8	19	48
☽	13	10	34	52	47	13	10	34	52	3	13	10	34	58	30	13	10	35	1	40
☽—☉	12	11	26	42	25	12	11	26	41	53	12	11	26	31	17	12	11	26	41	52
♂	0	31	26	28	7	0	31	26	28	11	0	31	26	36	53	0	31	26	39	23
☿	4	5	32	18	28	4	5	32	20	42	4	5	32	24	12	4	5	32	34	13
♃	0	4	59	9	9	0	4	59	8	48	0	4	59	14	26	0	4	59	15	53
♀	1	36	7	44	35	1	36	7	43	39	1	36	7	43	6	1	36	7	48	24
♄	0	2	0	22	52	0	2	0	22	53	0	2	0	33	31	0	2	0	35	38

In this comparative table, computed to fourth minutes, it will be remarked that the Hindu astronomers mostly agree to third minutes and differ in the fourths. They disagree with Ptolemy at the thirds, and give, in almost every instance, slower motions than he does to the planets, and still slower than the truth. In the moon's synodical motion, however, they are very nearly correct. On the other hand, the equation of the centre deducible from the epicycles (page [404]) is a nearer approximation to the truth than results from the excentricity assigned by Ptolemy to the orbits of the planets. For instance,

EXCENTRICITY OF THE SUN'S ORBIT.

	°	′	″
Súrya-siddhánta and Brahmagupta (Rad. of the epicycle)... ...	2	10	30
Hipparchus and Ptolemy (*Alm.*, l. 3, c. 4) in parts, of which radius contains 60	2	29	30
Albátaní (c. 28)	2	4	45

GREATEST EQUATION OF THE SUN'S CENTRE:

Súrya-siddhánta, etc. (computed by the commentators)	2	10	32
Ptolemy (Ricc. *Alm. nov.*)	2	23	0
Albátaní	1	59	0
Alphonsine Tables	2	10	0
Kepler, etc.	2	3	46
Lalande (3rd edit.)	1	55	36½

must, therefore, have used other observations besides those which he has recorded.

The Arabs adopted in its totality Ptolemy's theory of the motions of the planets; which the Hindus have only [413] in part. But the Arabs improved on his astronomy by careful observations: a praise to which the Hindus are not equally entitled. Albátaní discovered the motion of the Sun's apogee, and suspected from analogy a motion of the apsides of the minor planets.[1] The Hindus surmised the motion of the apogee of the Sun, and nodes and apsides of the planets, from analogy to the Moon's;[2] but were unable to verify the conjecture by observation; and have, in fact, merely assigned arbitrary numbers to the supposed revolutions, to bring out the places right (or as nearly so as they had determined them), relatively to the origin of the ecliptic at a vastly remote period. Bháskara, when treating of the manner of verifying or of finding the number of revolutions of the planets, etc. in a given period, teaches the mode of observing the planetary motions, but considers the life of man too short for observing the motion of the apsides and nodes (the Moon's excepted); and certainly the revolutions assigned to them by him and other Hindu astronomers are too few, and the motions too slow (the quickest not exceeding seven degrees in 100,000 years), to have been assumed on any other ground but the arbitrary one just now stated. The astronomical instruments employed by the Hindus, of which Bháskara describes nine, including one of his own invention, and comprehending the quadrant, semicircle and entire circle, besides the armillary sphere, horary ring, gnomon and clepsydra,[3] were too rudely executed, whatever may be thought of their design, to enable the astronomers to make very delicate observations; and they were not assisted, as in the precession of the equinoxes, by the memory of a former position recorded in their ancient writings.

[1] Montucla, p. 349.
[2] Bháskara in Vásaná-bháshya.
[3] *Goládhyáya*, ch. 9.

[414] NOTE REFERRED TO FROM PAGE [393].

According to Áryabhaṭṭa, as quoted by Brahmagupta and his scholiast Pṛithúdaka-swámí:—

	YEARS.
One *yuga* contains	1,080,000
One *mahá yuga* = 4 *yugas*	4,320,000
One *Manu yuga* = 72 *mahá yugas*	311,040,000
One *kalpa* = 14 *Manus* = 1008 *mahá yugas*	4,354,560,000
☞ The *kalpa* began on Thursday, 1st Chaitra-śukla, at the moment of sunrise at Lanká.	
Years expired from the commencement of the *kalpa* to the war of the Bhárata, or beginning of the Kali age	1,986,120,000
Add expired years of the Kali to the S'áka era	3,179
Years from the beginning of the *kalpa* to the commencement of the S'áka era	1,986,123,179
Years expired from the commencement of the present *mahá yuga*, to the beginning of the Kali age, when there was a conjunction	3,240,000
Revolutions of the earth round its own axis, in a quadruple *yuga* or *mahá yuga*	1,582,237,500
Hence, deducting revolutions of the sun	4,320,000
Remain, nycthemera, or *sávana* days, in a *mDha yuga* ...	1,577,917,500

☞ Length of the sidereal year is, therefore, according to Áryabhaṭṭa:— d. 365 g. 15 I 31 II 15 or d. 365 h. 6 I 12 II 30

N.B.—Áryabhaṭṭa taught the earth's diurnal revolution round its axis; a doctrine which Brahmagupta controverts; but to which his scholiast Pṛithúdaka-swámí inclines.

According to the Pauliśa-siddhánta cited by Bhaṭṭotpala on Varáhamihira's Sanhitá, and by Pṛithúdaka-swámí on Brahmagupta's Siddhánta:—

Kṛita yuga,	4,800 divine years	=	1,728,000
Tretá,	3,600 „	=	1,296,000
Dwápara,	2,400 „	=	864,000
			3,888,000
Kali,	1,200 „	=	432,000
Mahá yuga		=	4,320,000

☞ This author's computation of the *kalpa* has not been found in any quotation; but he is cited as reckoning its commencement from midnight.

[415] Years expired from the commencement of the present *mahá yuga* to the first conjunction of the planets in the *Kṛita yuga*	648,000
Interval between that and the last conjunction, at the beginning of the *Kali yuga*	3,240,000
Years expired to the commencement of the *Kali yuga* ...	3,888,000
Mean solar (*saura*) days, termed by other astronomers *sávana* days, in one *mahá yuga*	1,577,917,800

☞ Length of the year according to the Paulis'a-siddhánta :— d. 365 g. 15 I 31 II 30 or d. 365 h. 6 I 12 II 36

N.B.—The difference of 300 days in the computations of Áryabhaṭṭa and Pulis'a, gives one day in 14,400 years, as is remarked by Brahmagupta.

Length of the year according to the Súrya-siddhanta :— d. 365 g. 15 I 31 II 31 III 24 = d. 365 h. 6 I 12 II 36 III 33 IV 36

According to Brahmagupta :— 365 15 30 22 30 = 365 6 12 9

The computation of the *yuga* and *kalpa*, according to these authorities, is well known, and need not be exhibited in this place. They make it begin on Sunday; the one at midnight, the other at sunrise, on the meridian of Lanká; and the elapsed years to the beginning of the Kali age are, 1,972,944,000. To which Brahmagupta adds 3,179 years to the S'áka era. The Súrya-siddhánta deducts 17,064,000 years; making the epoch of a supposed conjunction of planets by so many years later than the beginning of the *kalpa*.

Revolutions of the Planets.

	According to Pulis'a quoted by Bhaṭṭotpala, In a *mahá yuga.*	According to the Súrya-siddhánta, In a *mahá yuga.*	According to Brahmagupta, In a *kalpa.*
Sun...	4,320,000	4,320,000	4,320,000,000
Moon (periodical)	57,753,336	57,753,336	57,753,300,000
Mars	2,296,824	2,296,832	2,296,828,522
Mercury	17,937,000	17,937,060	17,936,998,984
Jupiter	364,220	364,220	364,226,455
Venus	7,022,388	7,022,376	7,022,389,492
Saturn	146,564	146,568	146,567,298
Days ...	1,577,917,800	1,577,917,828	1,577,916,450,000

[416] ☞ Áryabhaṭṭa states the revolutions of Jupiter at 364,224; and Varáhamihira's rule for the cycle of sixty years of Jupiter is founded on that number. The periods assigned by these two authors to other planets have not been ascertained; except Saturn's aphelion, reckoned by Áryabhaṭṭa at fifty-four revolutions in a *kalpa*. Áryabhaṭṭa's numbers are said to have been derived from the Párás'ara-siddhánta. (As. Res., vol. ii., p. 242.)

APPENDIX TO ESSAYS ON HINDU ASTRONOMY.

[*** In the *Asiatic Journal* for 1826 Colebrooke wrote a reply to an attack which Bentley had published during the preceding year in his *Hindu Astronomy*. The attack was severe and unwarranted, and the language of part of the reply was unusually warm. I have reprinted that part of the letter which seemed to me to throw light on some of the author's views; but I have omitted everything of a personal nature, as unsuited to the tone of judicial calmness which pervades the Essays.—Ed.]

I now proceed to Mr. Bentley's direct attack on myself in the sixth section of the second part of his posthumous work.

His position is, that the longitudes of stars reckoned from the beginning of the Hindu sphere must be the same, whether given by an astronomer who lived a thousand years ago, or by one who only lived fifty years since; because they are reckoned from the same point. . . . Hence he affirms, "Mr. Colebrooke's notions are altogether unfounded."

I have shown in my treatise on the Indian divisions of the Zodiac (As. Res., vol. ix.), that the longitudes given in the Indian tables are the longitudes of the stars' circles of declination, and not of the stars themselves. It is distinctly so said by the Hindu writers cited by me in that Essay. The manner in which they direct observations to be made confirms the conclusion; for the intersecting circle, which they use on an armillary sphere to make the observation, is a circle of declination. I have repeatedly and explicitly so affirmed. I never maintained that tables of true longitudes would vary with the

time for which they are prepared. But surely tables of the longitudes of circles of declination are affected by precession, and require correction accordingly.

Mr. Bentley was aware of the distinction drawn by me, and has more than once noticed it in his posthumous work; but he suppresses that essential distinction in this place. I again assert, that the tabular longitudes and latitudes given in the Súrya-siddhánta and certain other Hindu works are not the true longitudes and latitudes of stars; nor did I speak of the stars' true longitudes in the passage in question. The computation which Mr. Bentley has himself exhibited from a Hindu author (at p. 176) evidently shows that the tabular longitude is that of the star's circle of declination; and not the star itself, which must be deduced from it by computation.

In fact, I have nowhere endeavoured to deduce the age of any Hindu work from longitudes of stars. The passage which I presume Mr. Bentley questions is one contained in my essay on the Indian divisions of the Zodiac, where "I suppose the original observations, of which the result is copied by successive authors, to have been made about the time when the vernal equinox was near the first degree of Mesha;" adding in a note, that "Brahmagupta wrote soon after that period, and the Súrya-siddhánta is probably a work of nearly the same age. Mr. Bentley considers it more modern. It cannot be more ancient; for the equinox must have past the beginning of Mesha, or have been near it, when that work was composed."

This I take to be what gave offence to Mr. Bentley. But it certainly does not express, nor hint, that the antiquity of a Hindu work may be deduced from the longitude of stars given in it.

Mr. Bentley (p. 199) pretends that "I was determined to adopt a new mode (by the longitudes of the fixed stars from the beginning of Aświní) for determining the age of the Súrya-siddhánta." I did not do so; and as there is no

reference to any particular passage, I can only conjecture that the one just now quoted is that to which he alluded.

Mr. Bentley misrepresents the question when he takes Cor leonis for an example. This star (the Maghá of the Indian zodiac) has no latitude in Hindu tables; and consequently the longitude of this star and that of its circle of declination are the same, and invariable according to those tables. But in the instance of stars which are distant from the ecliptic, the Hindu tables differ notably as to the longitude of stars' circles of declination.

In the instance of Brahmagupta I drew an inference as to the age when this author flourished, from his placing Revatí (ζ Piscium) precisely in the equinoctial point, without latitude or declination, and with no longitude. If Mr. Bentley had an eye to this passage (*Notes and Illustrations*, p. xxxv), he has misrepresented my meaning; for it is not from the longitude of the star, but from the coincidence of the tropical and sidereal spheres, according to Brahmagupta, that I here deduce the author's age.

Mr. Bentley comes next to what he terms Mr. C.'s other point, viz., the inference of Varáhamihira having lived 1300 years ago, because he stated one solstice in Karkaṭa and another in Makara. Mr. Bentley says that "Mr. Colebrooke has drawn a most incorrect conclusion."

I did not, as Mr. Bentley pretends, confound the tropical and sidereal spheres. My position was that the passage of Varáhamihira implied the actual coincidence of the two in his time. "At present," he says, "one solstice is in the beginning of Karkaṭa, and the other in the beginning of Makara." Mr. Bentley, after quoting the words, says, by this passage of Varáhamihira, the solstices were always at the beginning of Cancer and Capricorn. Are they not so now?

By that passage the solstices were not always at the beginning of Cancer and Capricorn. They are expressly said to be so at present; and a different former position of them is distinctly affirmed in the context of that very passage. See

Sir William Jones's supplement to his Essay on Indian Chronology, As. Res., vol. ii., p. 391.

In another passage of the same author similar terms occur (As. Res., vol. xii., p. 222). The solstice is there said to have formerly been in the middle of Áśleshá; but now the return of the sun takes place from Punarvasu. Here, then, it is clear that the sidereal, not the tropical, sphere is meant. Mr. Bentley has imputed to me as an error, that which, were it any error at all, was Sir William Jones's, but was never impugned by Mr. Bentley until I used the same argument. He had himself employed it to determine the age of Brahmagupta (As. Res., vol. viii., pp. 233 and 235), who flourished about A.D. 527, when the solstitial colure cut Punarvasu in the tenth degree, as is affirmed by Brahmagupta.

When it suits his purpose, Mr. Bentley was ready enough to admit that the Hindu sphere is sidereal. He distinctly stated it to be so at p. 163.

If the tropical sphere were intended by any Hindu astronomer in a passage relative to the position of the colures, it must be by Brahmagupta, who has not noticed any former different position of them, nor spoken of the precession of the equinoxes. Yet Mr. Bentley proposed the same argument, in relation to Brahmagupta, which he rejects, where it is more forcible, in reference to Varáhamihira: the one made for, the other against, the assumed ages of those astronomers respectively.

Mr. Bentley charges, as a mistranslation, when I put "eighth" for *ashṭamí*, and "fifteenth" for *panchadaśí*.

He says these terms refer to the moon's age, and never to the day of the month. My answer to this piece of hypercriticism is, that the moon's age is the day of the month, reckoning by lunar time, which is the ordinary Hindu mode.

Another point which Mr. Bentley has made the ground of an attack levelled at me, though I am not named by him, concerns the precession of equinoxes. The Hindu notion, as Mr.

Bentley describes it, is represented by an epicycle; but it is not the less true that a libration or oscillatory change is meant. For what else but libration is that change which advances at an uniform rate to a certain limit, then decreases at the same uniform rate to the like limit on the other side; and so on, backwards and forwards, alternately affirmative and negative, or additive and subtractive? Now, whether this change be represented by an epicycle or an oscillation, matters little: it is but a dispute about words, whether it should be termed a revolution in an epicycle, or trepidation in longitude, or libration. Mr. Samuel Davis termed it libration. I followed him in using the same term, which had been unquestioned. I showed that the same notion was to be found in the writings of Arabian astronomers.

The Hindus have not contended that their epicycles represent truly the theory of the celestial motions. In this instance, in particular, an epicycle does not well show the uniformity of the motion. For, the annual precession being uniform in the arc of the great circle, the motion is not uniform in the epicycle by which it is represented.

Mr. Bentley objects (p. 192) to Vishṇuchandra's number of revolutions of the equinoxes in a *kalpa,* concerning which, he says, I altered my opinion, and stated it to be right, having previously questioned it: if tried with the years now elapsed of any of the known *kalpas*, Mr. Bentley remarks, it will not give the quantity of the precession for the present time. The answer is very simple: the *kalpas*, by which Mr. Bentley tried the rule, are not Vishṇuchandra's. The expired years of that cycle, by him admitted, are yet unascertained. The system of one author is not to be tried by the numbers of another's.

Concerning Mr. Bentley's story of the fabrication of a spurious Brahma-siddhánta to impose on my credulity, I need only say that it is an idle guess, destitute of the smallest probability, and untrue in all particulars. The manuscript,

which he treats as a fabrication, has been long deposited, with the whole of my collections, in the East India Company's Library, where it may be inspected and examined by any Sanskrit scholar, who will pronounce without difficulty on the likelihood of its genuineness or imposture.

I might retort on Mr. Bentley that the Árya-siddhánta, described by him in the third section of the second part of his posthumous work, is not improbably a fabrication. No one but himself has yet seen it: the manuscript of it is not forthcoming: he did not understand Sanskrit, and therefore he was very liable to imposition: his notions, not to say prejudices, were well known to the natives who attended him; and he was as likely as his friend Col. Wilford to have fabrications imposed upon him. According to the quotations of authors, Áryáshṭaka and Daśagítiká were the titles of Áryabhaṭṭa's works, and not Árya-siddhánta. It is, in all likelihood, pseudonymous.

In reference to this matter I should here add, that after the essay, in which I quoted the Brahma-siddhánta, had been presented to the Asiatic Society of Calcutta, and while the question of its insertion in the Society's volume was yet under consideration, Mr. Bentley submitted to the Committee of Papers the sketch of an intended answer. There was in that sketch a gross error concerning the mean motions of planets; which I noticed in a short reply. The answer has never appeared: it was suppressed, as I infer, in consequence of that confutation of one of its main arguments.

The next important point regards the question whether the heliacal or cosmical rising of Canopus be intended in rules delivered by Hindu astronomers for the computation of the Agastya Udaya, which governs certain religious ceremonies that are to be performed when the star appears.

Mr. Bentley says, "the rules give the cosmical risings of Canopus, and not the heliacal:" and "this," he adds, "is evident from the authors themselves, who only state that,

when the sun is in the longitude given by the rule, then the star rises with the sun, and not a syllable about its being visible."

The words in my translation, which is what Mr. Bentley uses (he himself was ignorant of Sanskrit), are, "when Agastya rises or appears in the south at the close of the night." Surely it cannot be said that there is nothing about the star being visible; for what else does its appearance in the south intend?

Varáhamihira's rule of computation, as Mr. Bentley acknowledges, relates to the heliacal rising of Canopus; the instance which he exhibits of a computation by Lakshmídása gives the heliacal rising of the star. It is the heliacal rising, not the cosmical, which governs certain religious rites, for the sake of which the computation is instituted. Yet, in the face of all this, and much more, Mr. Bentley chooses to understand the rule given in the Bháswatí, and other works, as relative to the cosmical rising, that he may strain it into an argument for his new hypothesis of extensive forgeries in the time of Akbar.

The truth is, that the observations of Hindu astronomers were ever extremely coarse and imperfect, and their practice very inferior to their theory of Astronomy. An improved theory, or the hint of it, was borrowed from the west; but they did not learn to make correct observations. They were content, in practice, with a rude approximation.

Varáhamihira teaches two rules, which give results widely different, for the rising of Canopus; yet he marks no preference for one above the other. The Hindu observations of this star are so discordant, that the longitude of its circle of declination differs 10°, as given in various tables. It is 90° in one, 87° in two others, and 80° in a fourth. We are not to try their rules by the test of their agreement with accurate observation at any assignable moment, and thence conclude that the rule and its correct application are contemporaneous.

This has always been the point at issue between Mr. Bentley and me. He maintained, in his first essay, that the age of an astronomical Hindu treatise can be so determined with precision. I have always contended that their practical astronomy has been too loose and imperfect for the application of that test, unless as an approximation.

In one instance, by the rigorous use of his test, he would have had to pronounce that the work under examination is of an age yet to come (1454 years after A.D. 1799): see As. Res., vol. vi., p. 570. To avoid so monstrous an absurdity, he rejected this case, and deduced a mean from the whole of the other results, varying from 340 to 1105 years. He should have done the same with Varáha's two rules for the heliacal rising of Canopus: he should have taken the mean of the two; or, what would be more consonant with his own method of proceeding, he should have deduced the mean of all the data which any one work (Varáha's, for example) furnished, and not garbled it by selecting the case of Canopus singly, and drawing an inference from one out of two rules given.

The absurd conclusions at which Mr. Bentley has arrived by the limited and exclusive application of his test, the utter confusion which ensues, sufficiently demonstrate that it is not to be safely and implicitly trusted.

He pretends (p. 199) that I saw this mode of determining the antiquity of astronomical books by the positions of the planets sufficiently correct, when it suited my purpose, in the case of Brahmagupta, but would not admit it to be so with respect to the Súrya-siddhánta. This is utterly untrue: I never admitted it (though I am ready to do so as an approximation) in the case of Brahmagupta. I explicitly did so admit it in the instance of the Súrya-siddhánta. (As. Res., vol. xii., p. 226.[1]) I distinctly there said that "I accede to the position that the date of a system for the computation of the places of planets is deducible from the ascertainment of a

[1] [P. 343 in the present volume.]

time when the system gave results nearest to the truth." Mr. Bentley then has, contrary to truth, represented me as indisposed to admit that, which I expressly acceded to, explicitly declaring that I did so.

I have been no favourer nor advocate of Indian astronomy. I have endeavoured to lay before the public, in an intelligible form, the fruit of my researches concerning it: I have repeatedly noticed its imperfections; and have been ready to admit that it has been no scanty borrower as to theory.

The Hindus, as I have elsewhere remarked, cultivated astronomy for the sake of astrology, and for the regulation of their religious feasts. They have been content with a very inaccurate practice of it, which, however, was sufficient for the purposes of divination and a festal calendar.

Mr. Bentley concludes forgery and imposture where I only infer carelessness and inaccuracy.

XVI.

DISSERTATION ON THE ALGEBRA OF THE HINDUS.

[Prefixed to the Author's 'Algebra, with Arithmetic and Mensuration, from the Sanskrit of Brahmagupta and Bháskara.' London, 1817. 4to.]

[417] The history of sciences, if it want the prepossessing attractions* of political history and narration of events, is nevertheless not wholly devoid of interest and instruction. A laudable curiosity prompts to inquire the sources of knowledge; and a review of its progress furnishes suggestions tending to promote the same or some kindred study. We would know the people and the names at least of the individuals, to whom we owe particular discoveries and successive steps in the advancement of knowledge. If no more be obtained by the research, still the inquiry has not been wasted, which points aright the gratitude of mankind.

In the history of mathematical science, it has long been a question to whom the invention of Algebraic analysis is due? among what people, in what region, was it devised? by whom was it cultivated and promoted? or by whose labours was it reduced to form and system? and finally, from what quarter did the diffusion of its knowledge proceed? No doubt, indeed, is entertained of the source from which it was received immediately by modern Europe; though the channel have been a matter of question. We are well assured, that the Arabs

were mediately or immediately our instructors in this study. But the Arabs them[418]selves scarcely pretend to the discovery of Algebra. They were not in general inventors but scholars, during the short period of their successful culture of the sciences: and the germ at least of the Algebraic analysis is to be found among the Greeks in an age not precisely determined, but more than probably anterior to the earliest dawn of civilization among the Arabs; and this science in a more advanced state subsisted among the Hindus prior to the earliest disclosure of it by the Arabians to modern Europe.

The object of the present publication is to exhibit the science in the state in which the Hindus possessed it, by an exact version of the most approved treatise on it in the ancient language of India, with one of the earlier treatises (the only extant one) from which it was compiled. The design of this preliminary dissertation is to deduce from these and from the evidence which will be here offered, the degree of advancement to which the science had arrived in a remote age. Observations will be added, tending to a comparison of the Indian with the Arabian, the Grecian, and the modern Algebra: and the subject will be left to the consideration of the learned, for a conclusion to be drawn by them from the internal, no less than the external proof, on the question who can best vindicate a claim to the merit of having originally invented or first improved the methods of computation and analysis, which are the groundwork of both the simple and abstruser parts of Mathematics; that is, Arithmetic and Algebra: so far, at least, as the ancient inventions are affected; and also in particular points, where recent discoveries are concerned.

In the actual advanced condition of the analytic art, it is not hoped, that this version of ancient Sanskrit treatises on Algebra, Arithmetic, and Mensuration, will add to the resources of the art, and throw new light on mathematical

science, in any other respect, than as concerns its history. [419] Yet the remark may not seem inapposite, that had an earlier version of these treatises been completed, had they been translated and given to the public when the notice of mathematicians was first drawn to the attainments of the Hindus in astronomy and in sciences connected with it, some addition would have been then made to the means and resources of Algebra for the general solution of problems by methods which have been re-invented, or have been perfected, in the last age.

The treatises in question, which occupy the present volume, are the Víja-gaṇita and Lílávatí of Bháskara-áchárya, and the Gaṇitádhyáya and Kuṭṭakádhyáya of Brahmagupta. The two first mentioned constitute the preliminary portion of Bháskara's Course of Astronomy, entitled Siddhánta-śiromaṇi. The two last are the twelfth and eighteenth chapters of a similar course of astronomy, by Brahmagupta, entitled Bráhma-siddhánta.

The questions to be first examined in relation to these works are their authenticity and their age. To the consideration of those points we now proceed.

The period when Bháskara, the latest of the authors now named, flourished, and the time when he wrote, are ascertained with unusual precision. He completed his great work, the Siddhánta-śiromaṇí, as he himself informs us in a passage of it,[1] in the year 1072 Śáka. This information receives corroboration, if any be wanted, from the date of another of his works, the Karaṇa-kutúhala, a practical astronomical treatise, the epoch of which is 1105 Śáka;[2] thirty-three years subsequent to the completion of the systematic treatise. The date of the Siddhánta-śiromaṇi, of which the Víja-gaṇita and Lílávatí are parts, [420] is fixed, then, with the utmost

[1] *Goládhyáya*, or lecture on the sphere, c. 11. § 56. As. Res., vol. xii. p. 214 [p. 333 of the present volume].

[2] As. Res., *ibid.*

exactness, on the most satisfactory grounds, at the middle of the twelfth century of the Christian era, A.D. 1150.[1]

The genuineness of the text is established with no less certainty by numerous commentators in Sanskrit, besides a Persian version of it. Those commentaries comprise a perpetual gloss, in which every passage of the original is noticed and interpreted: and every word of it is repeated and explained. A comparison of them authenticates the text where they agree; and would serve, where they did not, to detect any alterations of it that might have taken place, or variations, if any had crept in, subsequent to the composition of the earliest of them. A careful collation of several commentaries,[2] and of three copies of the original work, has been made; and it will be seen in the notes to the translation how unimportant are the discrepancies.

From comparison and collation, it appears then that the work of Bháskara, exhibiting the same uniform text which the modern transcripts of it do, was in the hands of both Muhammadans and Hindus, between two and three centuries ago: and, numerous copies of it having been diffused throughout India, at an earlier period, as of a performance held in high estimation, it was the subject of study and habitual reference in countries and places so remote from each other as the north and west of India and the southern peninsula; or, to speak with the utmost precision, Jambusara in the west, Agra in North Hindustan, and Párthapura, Golagráma, Amarávatí, and Nandigráma, in the south.

[421] This, though not marking any extraordinary antiquity, nor approaching to that of the author himself, was a material point to be determined: as there will be in the sequel occasion to show that modes of analysis, and, in particular,

[1] Though the matter be introductory, the preliminary treatises on arithmetic and algebra may have been added subsequently, as is hinted by one of the commentators of the astronomical part (Várttik). The order there intimated places them after the computation of planets, but before the treatise on spherics; which contains the date.

[2] Note A.

general methods for the solution of indeterminate problems, both of the first and second degrees, are taught in the Víja-gaṇita, and those for the first degree repeated in the Lílávatí, which were unknown to the mathematicians of the west until invented anew in the last two centuries by algebraists of France and England. It will be also shown that Bháskara, who himself flourished more than six hundred and fifty years ago, was in this respect a compiler, and took those methods from Indian authors as much more ancient than himself.

That Bháskara's text (meaning the metrical rules and examples, apart from the interspersed gloss) had continued unaltered from the period of the compilation of his work until the age of the commentaries now current, is apparent from the care with which they have noticed its various readings and the little actual importance of these variations; joined to the consideration that earlier commentaries, including the author's own explanatory annotations of his text, were extant, and lay before them for consultation and reference. Those earlier commentaries are occasionally cited by name: particularly the Gaṇita-kaumudí, which is repeatedly quoted by more than one of the scholiasts.[1]

No doubt then can be reasonably entertained that we now possess the arithmetic and algebra of Bháskara, as composed and published by him in the middle of the twelfth century of the Christian era. The age of his precursors cannot be determined with equal precision. Let [422] us proceed, however, to examine the evidence, such as we can at present collect, of their antiquity.

Towards the close of his treatise on Algebra,[2] Bháskara informs us that it is compiled and abridged from the more diffuse works on the same subject bearing the names of Brahma (meaning no doubt Brahmagupta), Śrídhara, and Padmanábha; and in the body of his treatise he has cited a

[1] For example, by Súryadása, under Lílávatí, § 74; and still more frequently by Ranganátha.

[2] Víja-gaṇita, § 218.

passage of Śrídhara's algebra,[1] and another of Padmanábha's.[2] He repeatedly adverts to preceding writers, and refers to them in general terms, where his commentators understand him to allude to Áryabhaṭṭa, to Brahmagupta, to the latter's scholiast Chaturveda-pṛithúdaka-swámí,[3] and to the other writers above mentioned.

Most, if not all, of the treatises to which he thus alludes, must have been extant and in the hands of his commentators when they wrote, as appears from their quotations of them; more especially those of Brahmagupta and Áryabhaṭṭa, who are cited, and particularly the first mentioned, in several instances.[4] A long and diligent research in various parts of India has, however, failed of recovering any part of the Padmanábha-víja (or Algebra of Padmanábha), and of the algebraic and other works of Áryabhaṭṭa.[5] But the translator has been more fortunate in regard to the works of Śrídhara and Brahmagupta, having in his collection Śrídhara's compendium of arithmetic, and a copy, incomplete however, of the text and scholia of Brahmagupta's Bráhma-siddhánta, comprising, among other no less interesting matter, a chapter treating of arithmetic and mensuration; and another, [423] the subject of which is algebra: both of them fortunately complete.[6]

The commentary is a perpetual one; successively quoting at length each verse of the text; proceeding to the interpretation of it, word by word; and subjoining elucidations and remarks: and its colophon, at the close of each chapter, gives the title of the work and the name of the author.[7] Now the name which is there given, Chaturveda-pṛithúdaka-swámí, is that of a celebrated scholiast of Brahmagupta,

[1] *Víja-gaṇita*, § 131. [2] *Ibid*, § 142.
[3] Víja-gaṇ., ch. 5, note of Súryadása. Also Víja-gaṇ., § 174; and Líl., § 246, *ad finem*. [4] For example, under Líl., ch. 11.
[5] Note G. [6] Note B.
[7] Vásaná-bháshya, by Chaturveda-pṛithúdaka-swámí, son of Madhusúdana, on the Bráhma-siddhánta (or sometimes Bráhma-sphuṭa-siddhánta).

frequently cited as such by the commentaries of Bháskara and by other astronomical writers: and the title of the work, Bráhma-siddhánta,[1] or sometimes Bráhma-sphuṭa-siddhánta, corresponds, in the shorter form, to the known title of Brahmagupta's treatise in the usual references to it by Bháskara's commentators;[2] and answers, in the longer form, to the designation of it, as indicated in an introductory couplet which is quoted from Brahmagupta by Lakshmídása, a scholiast of Bháskara.[3]

Remarking this coincidence, the translator proceeded to collate, with the text and commentary, numerous quotations from both, which he found in Bháskara's writings, or in those of his expositors. The result confirmed the indication, and established the identity of both text and scholia as Brahmagupta's treatise, and the gloss of Pṛithúdaka. The authenticity of this Bráhma-siddhánta is further confirmed by numerous quotations in the commentary of Bhaṭṭotpala on the *sanhitá* of Varáha[424]mihira: as the quotations from the Bráhma-siddhánta in that commentary (which is the work of an author who flourished eight hundred and fifty years ago) are verified in the copy under consideration. A few instances of both will suffice, and cannot fail to produce conviction.[4]

It is confidently concluded, that the chapters on arithmetic and algebra, fortunately entire in a copy, in many parts imperfect, of Brahmagupta's celebrated work, as here described, are genuine and authentic. It remains to investigate the age of the author.

Mr. Davis, who first opened to the public a correct view of the astronomical computations of the Hindus,[5] is of opinion, that Brahmagupta lived in the seventh century of the Christian

[1] [It is more usually written Brahma-siddhánta, and so Colebrooke himself sometimes writes it.]

[2] They often quote from the Bráhma-siddhánta after premising a reference to Brahmagupta.

[3] Note C. [4] Note D. [5] As. Res., vol. ii. p. 225.

era.[1] Dr. William Hunter, who resided for some time with a British embassy at Ujjayaní, and made diligent researches into the remains of Indian science at that ancient seat of Hindu astronomical knowledge, was there furnished, by the learned astronomers whom he consulted, with the ages of the principal ancient authorities. They assigned to Brahmagupta the date of 550 Śáka; which answers to A.D. 628. The grounds on which they proceeded are unfortunately not specified: but, as they gave Bháskara's age correctly, as well as several other dates right, which admit of being verified, it is presumed that they had grounds, though unexplained, for the information which they communicated.[2]

Mr. Bentley, who is little disposed to favour the antiquity of an Indian astronomer, has given his reasons for considering the astronomical system which Brahmagupta teaches, to be between twelve and thirteen hundred years old (1263⅘ years in A.D. 1799).[3] Now, as the system taught by this author is professedly one corrected [425] and adapted by him to conform with the observed positions of the celestial objects when he wrote,[4] the age, when their positions would be conformable with the results of computations made as by him directed, is precisely the age of the author himself: and so far as Mr. Bentley's calculations may be considered to approximate to the truth, the date of Brahmagupta's performance is determined with like approach to exactness, within a certain latitude however of uncertainty for allowance to be made on account of the inaccuracy of Hindu observations.

The translator has assigned on former occasions[5] the grounds upon which he sees reason to place the author's age, soon after the period when the vernal equinox coincided with the beginning of the lunar mansion and zodiacal asterism

[1] As. Res. vol. ix. p. 242.

[2] Note E. [Dr. Bháu Dájí has shown by a quotation from the *Brahma-sphuṭa-siddhánta* that Brahmagupta fixes the date of composition of that work as 550 S'áka, or A.D. 628.]

[3] As. Res., vol. vi. p. 586.

[4] Suprà.

[5] As. Res., vol. ix. p. 329 [p. 287 of the present volume].

Aświní, where the Hindu ecliptic now commences. He is supported in it by the sentiments of Bháskara and other Indian astronomers, who infer from Brahmagupta's doctrine concerning the solstitial points, of which he does not admit a periodical motion, that he lived when the equinoxes did not, sensibly to him, deviate from the beginning of Aświní and middle of Chitrá on the Hindu sphere.[1] On these grounds it is maintained that Brahmagupta is rightly placed in the sixth or beginning of the seventh century of the Christian era; as the subjoined calculations will more particularly show.[2] The age when Brahmagupta flourished seems, then, from the concurrence of all these arguments, to be satisfactorily settled as antecedent to the earliest dawn of the culture of sciences among the Arabs; and consequently establishes the fact that the Hindus were in possession of algebra before it was known to the Arabians.

[426] Brahmagupta's treatise, however, is not the earliest work known to have been written on the same subject by an Indian author. The most eminent scholiast of Bháskara[3] quotes a passage of Áryabhaṭṭa specifying algebra under the designation of Víja, and making separate mention of Kuṭṭaka, which more particularly intends a problem subservient to the general method of resolution of indeterminate problems of the first degree: he is understood by another of Bháskara's commentators[4] to be at the head of the elder writers, to whom the text then under consideration adverts, as having designated by the name of Madhyamáharaṇa the resolution of affected quadratic equations by means of the completion of the square. It is to be presumed, therefore, that the treatise of Áryabhaṭṭa then extant did extend to quadratic equations in the determinate analysis, and to indeterminate problems of the first degree; if not to those of the second likewise, as most probably it did.

[1] As. Res., vol. xii. p. 215 [p. 334 of the present volume]. [2] Note F.

[3] Gaṇeśa, a distinguished mathematician and astronomer.

[4] Súr. on Víja-gaṇ. § 128.

This ancient astronomer and algebraist was anterior to both Varáhamihira and Brahmagupta, being repeatedly named by the latter; and the determination of the age when he flourished is particularly interesting, as his astronomical system, though on some points agreeing, essentially disagreed on others, with that which those authors have followed, and which the Hindu astronomers still maintain.[1]

He is considered by the commentators of the Súrya-siddhánta and Śiromaṇi,[2] as the earliest of uninspired and mere human writers on the science of astronomy; as having introduced requisite corrections into the system of [427] Paráśara, from whom he took the numbers for the planetary mean motions; as having been followed in the tract of emendation, after a sufficient interval to make further correction requisite, by Durgasinha and Mihira; who were again succeeded after a further interval by Brahmagupta son of Jishṇu.[3]

In short, Áryabhaṭṭa was founder of one of the sects of Indian astronomers, as Puliśa, an author likewise anterior to both Varáhamihira and Brahmagupta, was of another: which were distinguished by names derived from the discriminative tenets respecting the commencement of planetary motions at sunrise according to the first, but at midnight according to the latter,[4] on the meridian of Lanká, at the beginning of the great astronomical cycle. A third sect began the astronomical day, as well as the great period, at noon.

His name accompanied the intimation which the Arab astronomers (under the Abbasside Khalifs, as it would appear) received, that three distinct astronomical systems were current among the Hindus of those days: and it is but slightly corrupted, certainly not at all disguised, in the Arabic represen-

[1] Note G. [2] Nṛisinha on Súr. Gaṇeśa, pref. to Grah. lágh.

[3] As. Res. vol. ii. pp. 235, 242, and 244; and Note H.

[4] Brahmagupta, ch. 11. The names are Audayaka from *Udaya* 'rising;' and A'rdharátrika from *Ardharátri*, 'midnight.' The third school is noticed by Bhaṭṭotpala, the scholiast of Varáhamihira, under the denomination of Mádhyandinas, as alleging the commencement of the astronomical period at noon (from *Madhyandina*, 'midday').

tation of it *Arjabahar*, or rather Arjabhar.[1] The two other systems were, first, Brahmagupta's [428] Siddhánta, which was the one they became best acquainted with, and to which they apply the denomination of the *sind-hind;* and second, that of *Arka*, the Sun, which they write Árkand, a corruption still prevalent in the vulgar Hindí.[2]

Áryabhaṭṭa appears to have had more correct notions of the true explanation of celestial phenomena than Brahmagupta himself; who, in a few instances, correcting errors of his predecessor, but oftener deviating from that predecessor's juster views, has been followed by the herd of modern Hindu astronomers, in a system not improved, but deteriorated, since the time of the more ancient author.

Considering the proficiency of Áryabhaṭṭa in astronomical science, and adverting to the fact of his having written upon Algebra, as well as to the circumstance of his being named by numerous writers as the founder of a sect or author of a system in astronomy, and being quoted at the head of algebraists, when the commentators of extant treatises have occasion to mention early and original[3] writers on this branch of science, it is not necessary to seek further for a mathematician qualified to have been the great improver of the analytic art, and likely to have been the person by whom it was carried to the pitch to which it is found to have attained among the Hindus, and at which it is observed to be nearly stationary through the long lapse of ages which have since passed: the later additions being few and unessential in the writings of Brahmagupta, of Bháskara, and of Jnána-rája, though they lived at intervals of centuries from each other.

[1] The Sanskrit ṭ, it is to be remembered, is the character of a peculiar sound often mistaken for *r*, and which the Arabs were likely so to write, rather than with a *te* or with a *tau*. The Hindi ṭ is generally written by the English in India with an *r*. Example: *Ber* (*vaṭa*), the Indian fig, vulg. Banian tree. [Cf. Albírúní, Reinaud's *Mémoire*, p. 322.]

[2] See notes I, K, and N.

[3] Súrya-dása on Víja-gaṇita, ch. 5.

Áryabhaṭṭa then being the earliest author known to [429] have treated of Algebra among the Hindus, and being likely to be, if not the inventor, the improver of that analysis, by whom too it was pushed nearly to the whole degree of excellence which it is found to have attained among them, it becomes in an especial manner interesting to investigate any discoverable trace in the absence of better and more direct evidence, which may tend to fix the date of his labours, or to indicate the time which elapsed between him and Brahmagupta, whose age is more accurately determined.[1]

Taking Áryabhaṭṭa, for reasons given in the notes, to have preceded Brahmagupta and Varáhamihira by several centuries; and Brahmagupta to have flourished about twelve hundred years ago;[2] and Varáhamihira, concerning whose works and age some further notices will be found in a subjoined note,[3] to have lived at the beginning of the sixth century after Christ,[4] it appears probable that this earliest of known Hindu algebraists wrote as far back as the fifth century of the Christian era; and, perhaps, in an earlier age. Hence it is concluded that he is nearly as ancient as the Grecian algebraist Diophantus, supposed, on the authority of Abulfaraj,[5] to have flourished in the time of the Emperor Julian, or about A.D. 360.

Admitting the Hindu and Alexandrian authors to be nearly equally ancient, it must be conceded in favour of the Indian algebraist, that he was more advanced in the science; since he appears to have been in possession of the resolution of equations involving several unknown quantities, which it is not clear, nor fairly presumable, that Diophantus [430] knew; and a general method for indeterminate problems of at least the first degree, to a knowledge of which the Grecian algebraist had certainly not attained; though he displays infinite sagacity

[1] Note I.
[2] See before and note F.
[3] Note K.
[4] See before and note E.
[5] Pococke s edition and translation, p. 89.

and ingenuity in particular solutions; and though a certain routine is discernible in them.

A comparison of the Grecian, Hindu, and Arabian algebras, will more distinctly show, which of them had made the greatest progress at the earliest age of each that can be now traced.

The notation or algorithm of Algebra is so essential to this art, as to deserve the first notice in a review of the Indian method of analysis, and a comparison of it with the Grecian and Arabian algebras. The Hindu algebraists use abbreviations and initials for symbols: they distinguish negative quantities by a dot,[1] but have not any mark, besides the absence of the negative sign, to discriminate a positive quantity. No marks or symbols indicating operations of addition, or multiplication, etc., are employed by them: nor any announcing equality[2] or relative magnitude (greater or less).[3] But a factum is denoted by the initial syllable of a word of that import,[4] subjoined to the terms which compose it, between which a dot is sometimes interposed. A fraction is indicated by placing the divisor under the dividend,[5] but without a line of separation. The two sides of an equation are ordered in the same manner, one under the other:[6] and this method of placing [431] terms under each other being likewise practised upon other occasions,[7] the intent is in the instance to be collected from the recital of the steps of the process in words at length, which always accompanies the algebraic process. That recital is also requisite to ascertain the precise intent of vertical lines interposed between the terms of a geometric progression, but used also upon other occasions to separate and discriminate quantities. The symbols of unknown quantity

[1] Víja-gaṇ. § 4.

[2] The sign of equality was first used by Robert Recorde, because, as he says, no two things can be more equal than a pair of parallels, or *gemowe* lines of one length.—Hutton.

[3] The signs of relative magnitude were first introduced into European algebra by Harriot.

[4] Víja-gaṇ. § 21.

[5] Líl. § 33.

[6] Víja-gaṇ. and Brahm. 18, passim.

[7] Víja-gaṇ. § 55.

are not confined to a single one: but extend to ever so great a variety of denominations: and the characters used are initial syllables of the names of colours,[1] excepting the first, which is the initial of *yávat-távat*, 'as much as'; words of the same import with Bombelli's *tanto*, used by him for the same purpose. Colour, therefore, means unknown quantity, or the symbol of it: and the same Sanskrit word, *varṇa*, also signifying a literal character, letters are accordingly employed likewise as symbols; either taken from the alphabet;[2] or else initial syllables of words signifying the subjects of the problem; whether of a general nature,[3] or specially the names of geometric lines in algebraic demonstrations of geometric propositions or solutions of geometric problems.[4] Symbols too are employed, not only for unknown quantities, of which the value is sought; but for variable quantities of which the value may be arbitrarily put (*Víj.* ch. 6, note on commencement of § 153—156), and especially in demonstrations, for both given and sought quantities. Initials of the terms for square and solid respectively denote those powers; and combined they indicate the higher. These are reckoned not by the sums of the powers, but by their products. An initial[5] syllable is in like manner [432] used to mark a surd root.[6] The terms of a compound quantity are ordered according to the powers; and the absolute number invariably comes last. It also is distinguished by an initial syllable, as a discriminative token of known quantity.[7] Numeral coefficients are employed, inclusive of unity which is always noted, and comprehending fractions;[8] for the numeral divisor is generally so placed, rather than under the symbol of the unknown: and in like manner the negative dot is set over the numeral coefficient: and not over the literal character. The

[1] Víja-gaṇ. § 17. Brahm. c. 18. § 2.
[2] Víja-gaṇ. ch. 6.
[3] Víja-gaṇ. § 111.
[4] Víja-gaṇ. § 146.
[5] Líl. § 26.
[6] Víja-gaṇ. § 29.
[7] Víja-gaṇ. § 17.
[8] Stevinus in like manner included fractions in coefficients.

coefficients are placed after the symbol of the unknown quantity.[1] Equations are not ordered so as to put all the quantities positive; nor to give precedence to a positive term in a compound quantity: for the negative terms are retained, and even preferably put in the first place. In stating the two sides of an equation, the general, though not invariable, practice is, at least in the first instance, to repeat every term, which occurs in the one side, on the other: annexing nought for the coefficient, if a term of that particular denomination be there wanting.

If reference be made to the writings of Diophantus, and of the Arabian algebraists, and their early disciples in Europe, it will be found, that the notation, which has been here described, is essentially different from all theirs, much as they vary. Diophantus employs the inverted medial of ἔλλειψις, defect or want (opposed to ὕπαρξις, substance or abundance[2]), to indicate a negative quantity. He prefixes that mark ⋔ to the quantity in question. He calls the unknown, ἀριθμός; representing it by the final ς, which [433] he doubles for the plural; while the Arabian algebraists apply the equivalent word for number to the constant or known term; and the Hindus, on the other hand, refer the word for numerical character to the coefficient. He denotes the monad, or unit absolute, by μ^o; and the linear quantity is called by him *arithmos;* and designated, like the unknown, by the final sigma. He marks the further powers by initials of words signifying them; δ^v, κ^v, $\delta\delta^v$, $\delta\kappa^v$, $\kappa\kappa^v$, etc. for *dynamis*, power (meaning the square); *cubos*, cube; *dynamo-dynamis*, biquadrate, etc. But he reckons the higher by the sums, not the products, of the lower.[3] Thus the sixth power is with him the *cubo-cubos*, which the Hindus designate as the quadrate-cube (cube of the square, or square of the cube).

[1] Vieta did so likewise.

[2] A word of nearly the same import with the Sanskrit *dhana*, used by Hindu algebraists for the same signification.

[3] Def. 9.

The Arabian algebraists are still more sparing of symbols, or rather entirely destitute of them.[1] They have none, whether arbitrary or abbreviated, either for quantities known or unknown, positive or negative, or for the steps and operations of an algebraic process; but express everything by words, and phrases, at full length. Their European scholars introduced a few, and very few abbreviations of names: c^o, c^e, c^u, for the three first powers; c^o, q^a, for the first and second unknown quantities; p, m, for plus and minus; and ℞ for the note of radicality; occur in the first printed work, which is that of Paciolo.[2] Leonardo Bonacci of Pisa, the earliest scholar of the Arabians,[3] is said by Targioni Tozzetti to have used the small letters of the alphabet to denote quantities.[4] But Leo[434]nardo only does so because he represents quantities by straight lines, and designates those lines by letters, in elucidation of his algebraic solutions of problems.[5]

The Arabians termed the unknown (and they wrought but on one) *shai*, thing. It is translated by Leonardo of Pisa and his disciples, by the correspondent Latin word *res* and Italian *cosa;* whence *Regola de la Cosa*, and Rule of *Coss*, with *Cossike* practice and *Cossike* number of our older authors,[6] for Algebra or Speculative practice, as Paciolo[7] denominates the analytic art; and *Cossic* number, in writers of a somewhat later date, for the root of an equation.

The Arabs termed the square of the unknown *mál*, possession or wealth; translated by the Latin *census* and Italian *censo;* as terms of the same import: for it is in the acceptation of amount of property or estate[8] that *census* was here used by Leonardo.

1 As. Res., vol. xiii. p. 183.

2 Or Pacioli, Paciuolo,—li, etc. For the name is variously written by Italian authors.

3 See note L.

4 *Viaggi*, second edition, vol. ii. p. 62.

5 Cossali, Origine dell'Algebra, i.

6 Robert Recorde's Whetstone of Witte.

7 Secondo noi detta Pratica Speculativa. Summa 8. 1.

8 *Census*, quicquid fortunarum quis habet. Steph. Thes.

The cube was by the Arabs termed *ka'b*, a die or cube; and they combined these terms *mál* and *ka'b* for compound names of the more elevated powers, in the manner of Diophantus, by the sums of the powers; and not like the Hindus by their products. Such, indeed, is their method in the modern elementary works: but it is not clear that the same mode was observed by their earlier writers; for their Italian scholars denominated the biquadrate and higher powers Relato primo, secundo, tertio, etc.

Positive they call *záid* additional; and negative *nákis* deficient: and, as before observed, they have no discriminative marks for either of them.

[435] The operation of *restoring* negative quantities, if any there be, to the positive form, which is an essential step with them, is termed *jabr*, or with the article *Aljabr*, the mending or restoration. That of *comparing* the terms and taking like from like, which is the next material step in the process of resolution, is called by them *mukábalah*, comparison. Hence the name of *Tarík aljabr wa almukábalah*, 'the method of restoration and comparison,' which obtained among the Arabs for this branch of the analytic art; and hence our name of Algebra, from Leonardo of Pisa's exact version of the Arabic title. *Fí istikhráji'l majhúlát bi tarík aljabr wa almukábalah,*[1] De solutione quarundam quæstionum secundum modum *Algebræ* et *Almuchabalæ*.[2]

The two steps or operations which have thus given name to the method of analysis, are precisely what is enjoined without distinctive appellations of them, in the introduction of the arithmetics of Diophantus, where he directs, that, if the quantities be positive on both sides, like are to be taken from like, until one species be equal to one species; but if on either side or on both any species be negative, the negative species must be added to both sides, so that they become positive on

[1] *Khulásatu'l-hisáb*. c. 8. *Calcutta*, 1812 (8vo.).
[2] *Liber abbaci*, 9. 15. 3. MS. in Magliab. Libr.

both sides of the equation: after which like are again to be taken from like, until one species remain on each side.[1]

The Hindu algebra not requiring the terms of the equation to be all exhibited in the form of positive quantity, does not direct the preliminary step of *restoring* negative quantity to the affirmative state, but proceeds at once to the operation of equal subtraction (*samaśodhana*) for the difference of like terms, which is the process denominated [436] by the Arabian algebraists comparison (*mukábalah*). On that point, therefore, the Arabian algebra has more affinity to the Grecian than to the Indian analysis.

As to the progress which the Hindus had made in the analytic art, it will be seen, that they possessed well the arithmetic of surd roots;[2] that they were aware of the infinite quotient resulting from the division of finite quantity by cipher;[3] that they knew the general resolution of equations of the second degree, and had touched upon those of higher denomination, resolving them in the simplest cases, and in those in which the solution happens to be practicable by the method which serves for quadratics:[4] that they had attained a general solution of indeterminate problems of the first degree;[5] that they had arrived at a method for deriving a multitude of solutions of answers to problems of the second degree from a single answer found tentatively,[6] which is as near an approach to a general solution of such problems as was made until the days of Lagrange, who first demonstrated, that the problem, on which the solutions of all questions of this nature depend, is always resolvable in whole numbers.[7] The Hindus had likewise attempted problems of this higher order by the application of the method which suffices for those

[1] Def. 11. [2] Brahm. 18, § 27—29. Víj.-gaṇ. § 23—52.
[3] Líl. § 45. Víj.-gaṇ. § 15—16 and § 135.
[4] Víj.-gaṇ. § 129, and § 137—138.
[5] Brahm. 18. § 3—18. Víj.-gaṇ. § 53—73. Líl. § 248—265.
[6] Brahm. 18. § 29—49. Víj.-gaṇ. § 75—99.
[7] Mem. of Acad. of Turin: and of Berlin.

of the first degree;[1] with indeed very scanty success, as might be expected.

They not only applied algebra both to astronomy[2] and [437] to geometry,[3] but conversely applied geometry likewise to the demonstration of algebraic rules.[4] In short, they cultivated algebra much more, and with greater success, than geometry; as is evident from the comparatively low state of their knowledge in the one,[5] and the high pitch of their attainments in the other: and they cultivated it for the sake of astronomy, as they did this chiefly for astrological purposes. The examples in the earliest algebraic treatise extant (Brahmagupta's) are mostly astronomical: and here the solution of indeterminate problems is sometimes of real and practical use. The instances in the later treatise of algebra by Bháskara are more various: many of them geometric; but one astronomical; the rest numeral: among which a great number of indeterminate; and of these some, though not the greatest part, resembling the questions which chiefly engage the attention of Diophantus. But the general character of the Diophantine problems, and of the Hindu unlimited ones, is by no means alike: and several in the style of Diophantine are noticed by Bháskara in his arithmetical, instead of his algebraic, treatise.[6]

To pursue this summary comparison further, Diophantus appears to have been acquainted with the direct resolution of affected quadratic equations; but less familiar with the management of them, he seldom touches on it. Chiefly busied with indeterminate problems of the first degree, he yet seems to have possessed no general rule for their solution. His elementary instructions for the preparation of equations are succinct;[7] his notation, as before [438] observed, scanty

[1] Víj.-gaṇ. § 206—207.
[2] Brahm. 18, passim. Víj.-gaṇ.
[3] Víj.-gaṇ. § 117—127, § 146—152.
[4] Víj.-gaṇ. § 212—214.
[5] Brahm. 12. § 21; corrected however in Líl. § 169—170.
[6] Líl. § 59—61, where it appears, however, that preceding writers had treated the question algebraically. See likewise § 139—146.
[7] Def. 11.

and inconvenient. In the whole science he is very far behind the Hindu writers, notwithstanding the infinite ingenuity by which he makes up for the want of rule, and although presented to us under the disadvantage of mutilation; if it be, indeed, certain that the text of only six, or at most seven, of thirteen books, which his introduction announces, has been preserved.[1] It is sufficiently clear from what does remain, that the lost part could not have exhibited a much higher degree of attainment in the art. It is presumable, that so much as we possess of his work is a fair specimen of the progress which he and the Greeks before him (for he is hardly to be considered as the inventor, since he seems to treat the art as already known) had made in his time.

The points in which the Hindu algebra appears particularly distinguished from the Greek are, besides a better and more comprehensive algorithm,—1st, The management of equations involving more than one unknown term. (This adds to the two classes noticed by the Arabs, namely, simple and compound, two, or rather three, other classes of equation.) 2nd, The resolution of equations of a higher order, in which, if they achieved little, they had, at least, the merit of the attempt, and anticipated a modern discovery in the solution of biquadratics. 3rd, General methods for the solutions of indeterminate problems of first and second degrees, in which they went far, indeed, beyond Diophantus, and anticipated discoveries of modern algebraists. 4th, Application of algebra to astronomical investigation and geometrical demonstration, in which also they hit upon some matters which have been reinvented in later times.

This brings us to the examination of some of their anti-[439]cipations of modern discoveries. The reader's notice will be here drawn to three instances in particular.

The first is in the demonstration of the noted proposition of Pythagoras, concerning the square of the base of a rectangular

[1] Note M.

triangle, equal to the squares of the two legs containing a right angle. The demonstration is given two ways in Bháskara's algebra (Víj.-gaṇ. § 146). The first of them is the same which is delivered by Wallis in his treatise on angular sections (ch. vi.), and, as far as appears, then given for the first time.[1]

On the subject of demonstrations, it is to be remarked that the Hindu mathematicians proved propositions both algebraically and geometrically: as is particularly noticed by Bháskara himself, towards the close of his algebra, where he gives both modes of proof of a remarkable method for the solution of indeterminate problems, which involve a factum of two unknown quantities. The rule which he demonstrates is of great antiquity in Hindu algebra, being found in the works of his predecessor Brahmagupta, and being there a quotation from a more ancient treatise; for it is injudiciously censured, and a less satisfactory method by unrestricted arbitrary assumption given in its place. Bháskara has retained both.

The next instance, which will be here noticed, is the general solution of indeterminate problems of the first degree. [440] It was first given among moderns by Bachet de Meziriac in 1624.[2] Having shown how the solution of equations of the form $ax-by=c$ is reduced to $ax-by=\pm 1$, he proceeds to resolve this equation; and prescribes the same operation on a and b as to find the greatest common divisor. He names the

[1] He designates the sides C. D. Base B. Segments κ, δ. Then

$$\left.\begin{matrix} B : C :: C : \kappa \\ B : D :: D : \delta \end{matrix}\right\} \text{ and therefore } \left\{\begin{matrix} C^2 = B\,\kappa \\ D^2 = B\,\delta \end{matrix}\right.$$

Therefore $C^2+D^2=(B\kappa+B\delta=B \text{ into } \kappa+\delta=)\ B^2$.

The Indian demonstration, with the same symbols, is

$$\left.\begin{matrix} B : C :: C : \kappa \\ B : D :: D : \delta \end{matrix}\right\} \text{ therefore } \left\{\begin{matrix} \kappa = \dfrac{C^2}{B} \\ \delta = \dfrac{D^2}{B} \end{matrix}\right.$$

Therefore $B=\kappa+\delta=\dfrac{C^2}{B}+\dfrac{D^2}{B}$ and $B^2=C^2+D^2$.

[2] Problèmes plaisans et délectables qui se font par les nombres. 2nd edit. (1624). Lagrange's additions to Euler's Algebra, ij. 382. (Edit. 1807.)

residues c, d, e, f, etc., and the last remainder is necessarily unity: a and b being prime to each other. By retracing the steps from $e\mp1$ or $f\pm1$ (according as the number of remainders is even or odd) $e\mp1=\epsilon$, $\frac{\epsilon d\pm1}{e}=\delta$, $\frac{\delta c\mp1}{d}=\gamma$, $\frac{\gamma b\pm1}{c}=\beta$, $\frac{\beta a\mp1}{b}=\alpha$ or $f\pm1=\zeta$, $\frac{\zeta e\mp1}{f}=\epsilon$, $\frac{\epsilon d\pm1}{e}=\delta$, etc.

The last numbers β and α will be the smallest values of x and y. It is observed, that if a and b be not prime to each other, the equation cannot subsist in whole numbers, unless c be divisible by the greatest common measure of a and b.

Here we have precisely the method of the Hindu algebraists, who have not failed, likewise, to make the last cited observation. See Brahm. Algebra, section 1, and Bhásk. *Líl.* ch. xii. *Vij.* ch. ii. It is so prominent in the Indian algebra as to give name to the oldest treatise on it extant, and to constitute a distinct head in the enumeration of the different branches of mathematical knowledge in a passage cited from a still more ancient author. See *Líl.* § 248.

Confining the comparison of Hindu and modern algebras to conspicuous instances, the next for notice is that of the solution of indeterminate problems of the second degree; for which a general method is given by Brahmagupta, [441] besides rules for subordinate cases, and two general methods (one of them the same with Brahmagupta's), besides special cases, subservient, however, to the universal solution of problems of this nature; and, to obtain whole numbers in all circumstances, a combination of the method for problems of the first degree with that for those of the second, employing them alternately, or, as the Hindu algebraist terms it, proceeding in a circle.

Bháskara's second method (*Vij.* § 80–81) for a solution of the problem on which all indeterminate ones of this degree depend, is exactly the same which Lord Brouncker devised to answer a question proposed by way of challenge by Fermat in 1657. The thing required was a general rule for finding the

innumerable square numbers, which multiplied by a proposed (non-quadrate) number, and then assuming an unit, will make a square. Lord Brouncker's rule, putting n for any given number, r^2 for any square taken at pleasure, and d for difference between n and r^2 ($r^2 \backsim n$) was $\frac{4r^2}{d^2}\left(=\frac{2r}{d}\times\frac{2r}{d}\right)$ the square required. In the Hindu rule, using the same symbols, $\frac{2r}{d}$ is the square root required.[1] But neither Brouncker, nor Wallis, who himself contrived another method, nor Fermat, by whom the question was proposed, but whose mode of solution was never made known by him (probably because he had not found anything better than Wallis and Brouncker discovered[2]), nor Frenicle, who treated the subject, without, however, adding to what had been done by Wallis and Brouncker,[3] appear to have been aware of the importance of the problem and its universal use; a discovery which, among the moderns, was reserved for Euler in the middle of the last century. To him, [442] among the moderns, we owe the remark, which the Hindus had made more than a thousand years before,[4] that the problem was requisite to find all the possible solutions of equations of this sort. Lagrange takes credit for having further advanced the progress of this branch of the indeterminate analysis, so lately as 1767;[5] and his complete solution of equations of the second degree appeared no earlier than 1769.[6]

It has been pretended, that traces of the art are to be discovered in the writings of the Grecian geometers, and particularly in the five first propositions of Euclid's thirteenth book; whether, as Wallis conjectures, what we there have be the work of Theon or some other ancient scholiast, rather

[1] Vij.-gaṇ. § 80–81. [2] Wallis, Alg. c. 98. [3] *Ibid.*
[4] Bháskara, *Vij.* § 173, and § 207. See likewise Brahm. Alg. § 7.
[5] Mém. de l'Acad. de Berlin, vol. xxiv.
[6] See French translation of Euler's Algebra, Additions, p. 286. And Legendre, Théorie des Nombres, 1. § 6. No. 36.

than of Euclid himself:[1] also examples of analytic investigation in Pappus;[2] and indications of a method somewhat of a like nature with algebra, or at least the effects of it, in the works of Archimedes and Apollonius, though they are supposed to have very studiously concealed this their art of invention.[3]

This proceeds on the ground of considering analysis and algebra as interchangeable terms; and applying to algebra Euclid's or Theon's definition of analysis, 'a taking of that as granted, which is sought, and thence by consequences arriving at what is confessedly true.'[4]

Undoubtedly they possessed a geometrical analysis; hints or traces of which exist in the writings of more than [443] one Greek mathematician, and especially in those of Archimedes. But this is very different from the algebraic calculus. The resemblance extends, at most, to the method of inversion; which both Hindus and Arabians consider to be entirely distinct from their respective algebras; and which the former, therefore, join with their arithmetic and mensuration.[5]

In a very general sense, the analytic art, as Hindu writers observe, is merely sagacity exercised, and is independent of symbols, which do not constitute the art. In a more restricted sense, according to them, it is calculation attended with the manifestation of its principles; and, as they further intimate, a method aided by devices, among which symbols and literal signs are conspicuous.[6] Defined, as analysis is by an illustrious modern mathematician,[7] 'a method of resolving mathematical problems by reducing them to equations,' it assuredly is not to be found in the works of any Grecian writer extant, besides Diophantus.

In his treatise the rudiments of algebra are clearly con-

[1] Wallis, Algebra, c. 2.
[2] *Ibid.* and Preface.
[3] *Ibid.* and Nunez, Algebra 114.
[4] Wallis, following Vieta's Version, Alg. c. 1.
[5] Lîl. 3. 1. § 47. Khulásatu'l Hisáb. c. 5.
[6] Vîj.-gaṇ. § 110, 174, 215, 224.
[7] D'Alembert.

tained. He delivers in a succinct manner the algorithm of affirmative and negative quantities; teaches to form an equation; to transpose the negative terms; and to bring out a final simple equation comprising a single term of each species known and unknown.

Admitting, on the ground of the mention of a mathematician of his name, whose works were commented by Hypatia about the beginning of the fifth century,[1] and on the authority of the Arabic annals of an Armenian Christian,[2] which make him contemporary with Julian, that [444] he lived towards the middle of the fourth century of the Christian era; or, to speak with precision, about the year 360;[3] the Greeks will appear to have possessed in the fourth century so much of algebra, as is to be effected by dexterous application of the resolution of equations of the first degree, and even the second, to limited problems: and to indeterminate also, without, however, having attained a general solution of problems of this latter class.

The Arabs acquired algebra, extending to simple and compound (meaning quadratic) equations: but it was confined, so far as appears, to limited problems of those degrees; and they possessed it so early as the close of the eighth century, or commencement of the ninth. Treatises were at that period written in the Arabic language on the algebraic analysis, by two distinguished mathematicians who flourished under the Abbasside Almámún; and the more ancient of the two, Muhammad ben Músa al Khuwárazmí, is recognized among the Arabians as the first who made algebra known to them. He is the same who abridged, for the gratification of Almámún, an astronomical work taken from the Indian system in the preceding age, under Almansúr. He framed tables, like-

[1] Suidas, in voce *Hypatia*.

[2] Gregory Abulfaraj. Ex iis etiam [nempe philosophis qui prope tempora Juliani floruerunt] Diophantus, cujus liber, quem Algebram vocant, celebris est, in quem si immiserit se lector, oceanum hoc in genere reperiet.—*Pococke*.

[3] Julian was emperor from 360 to 363. See note M.

wise, grounded on those of the Hindus, which he professed to correct. And he studied and communicated to his countrymen the Indian compendious method of computation; that is, their arithmetic, and, as is to be inferred, their analytic calculus also.[1]

The Hindus in the fifth century, perhaps earlier,[2] were in possession of Algebra extending to the general solution [445] of both determinate and indeterminate problems of the 1st and 2nd degrees: and subsequently advanced to the special solution of biquadratics wanting the second term; and of cubics in very restricted and easy cases.

Priority seems then decisive in favour of both Greeks and Hindus against any pretensions on the part of the Arabians, who in fact, however, prefer none, as inventors of algebra. They were avowed borrowers in science; and, by their own unvaried acknowledgment, from the Hindus they learnt the science of numbers. That they also received the Hindu algebra is much more probable than that the same mathematician who studied the Indian arithmetic and taught it to his Arabian brethren, should have hit upon algebra unaided by any hint or suggestion of the Indian analysis.

The Arabs became acquainted with the Indian astronomy and numerical science before they had any knowledge of the writings of the Grecian astronomers and mathematicians; and it was not until after more than one century, and nearly two, that they had the benefit of an interpretation of Diophantus, whether version or paraphrase, executed by Muhammad Abúlwafá al Buzjání; who added, in a separate form, demonstrations of the propositions contained in Diophantus; and who was likewise author of commentaries on the algebraic treatises of the Khuwarazmite Muhammad ben Músa, and of another algebraist of less note and later date, Abú Yahyá, whose lectures he had personally attended.[3] Any inference to be drawn from their knowledge and study of the Arithmetics

[1] Note N. [2] See note I. [3] See Note N.

of Diophantus, and their seeming adoption of his preparation of equations in their own algebra, or at least the close resemblance of both on this point, is of no avail against the direct evidence, [446] with which we are furnished by them, of previous instruction in algebra and the publication of a treatise on the art, by an author conversant with the Indian science of computation in all its branches.

But the age of the earliest known Hindu writer on algebra not being with certainty carried to a period anterior, or even quite equal to that in which Diophantus is on probable grounds placed, the argument of priority, so far as investigation has yet proceeded, is in favour of Grecián invention. The Hindus, however, had certainly made distinguished progress in the science, so early as the century immediately following that in which the Grecian taught the rudiments of it. The Hindus had the benefit of a good arithmetical notation: the Greeks, the disadvantage of a bad one. Nearly allied as algebra is to arithmetic, the invention of the algebraic calculus was more easy and natural where arithmetic was best handled. No such marked identity of the Hindu and Diophantine systems is observed, as to demonstrate communication. They are sufficiently distinct to justify the presumption, that both might be invented independently of each other.

If, however, it be insisted, that a hint or suggestion, the seed of their knowledge, may have reached the Hindu mathematicians immediately from the Greeks of Alexandria, or mediately through those of Bactria, it must at the same time be confessed, that a slender germ grew and fructified rapidly, and soon attained an approved state of maturity in Indian soil.

More will not be here contended for: since it is not impossible, that the hint of the one analysis may have been actually received by the mathematicians of the other nation; nor unlikely, considering the arguments which may be brought for a probable communication on the subject of astrology; and

adverting to the intimate connexion between [447] this and the pure mathematics, through the medium of astronomy.

The Hindus had undoubtedly made some progress at an early period in the astronomy cultivated by them for the regulation of time. Their calendar, both civil and religious, was governed chiefly, not exclusively, by the moon and sun: and the motions of these luminaries were carefully observed by them, and with such success that their determination of the moon's synodical revolution, which was what they were principally concerned with, is a much more correct one than the Greeks ever achieved.[1] They had a division of the ecliptic into twenty-seven and twenty-eight parts, suggested evidently by the moon's period in days, and seemingly their own: it was certainly borrowed by the Arabians.[2] Being led to the observation of the fixed stars, they obtained a knowledge of the positions of the most remarkable; and noticed, for religious purposes, and from superstitious notions, the heliacal rising, with other phænomena of a few. The adoration of the sun, of the planets, and of the stars, in common with the worship of the elements, held a principal place in their religious observances enjoined by the Vedas:[3] and they were led consequently by piety to watch the heavenly bodies. They were particularly conversant with the most splendid of the primary planets; the period of Jupiter being introduced by them, in conjunction with those of the sun and moon, into the regulation of their calendar, sacred and civil, in the form of the celebrated cycle of sixty years, common to them and to the Chaldeans, and still retained by them. From that cycle they advanced by progressive stages, as the Chaldeans likewise did, to larger periods; at first by combining [448] that with a number specifically suggested by other, or more correctly determined, revolutions of the heavenly bodies; and afterwards by merely augmenting the places of figures for greater scope (preferring

[1] As. Res., vol. ii. and xii.
[2] See p. 281, etc., of the present volume.
[3] See Essays, vol. i. p. [106].

this to the more exact method of combining periods of the planets by an algebraic process, which they likewise investigated[1]), until they arrived finally at the unwieldy cycles named Maháyugas and Kalpas. But it was for the sake of astrology that they pushed their cultivation of astronomy, especially that of the minor planets, to the length alluded to. Now divination, by the relative position of the planets, seems to have been, in part at least, of a foreign growth, and comparatively recent introduction, among the Hindus. The belief in the influence of the planets and stars upon human affairs is with them, indeed, remotely ancient; and was a natural consequence of their creed, which made the sun a divine being, and the planets gods. But the notion, that the tendency of that supposed influence, or the manner in which it will be exerted, may be foreseen by man, and the effect to be produced by it foretold, through a knowledge of the position of the planets at a particular moment, is no necessary result of that creed; for it takes from beings believed divine, free-agency in other respects, as in their visible movements.

Whatever may have been the period when the notion first obtained, that foreknowledge of events on earth might be gained by observations of planets and stars, and by astronomical computation, or wherever that fancy took its rise, certain it is that the Hindus have received and welcomed communications from other nations on topics of astrology: and although they had astrological divinations of their own as early as the days of Paráśara and [449] Garga, centuries before the Christian era, there are yet grounds to presume that communications subsequently passed to them on the like subject, either from the Greeks, or from the same common source (perhaps that of the Chaldeans) whence the Greeks derived the grosser superstitions engrafted on their own genuine and ancient astrology, which was meteorological.

This opinion is not now suggested for the first time.

[1] Brahmagupta, Algebra.

Former occasions have been taken of intimating the same sentiment on this point:[1] and it has been strengthened by further consideration of the subject. As the question is closely connected with the topics of this dissertation, reasons for this opinion will be stated in the subjoined note.[2]

Joining this indication to that of the division of the zodiac into twelve signs, represented by the same figures of animals, and named by words of the same import with the zodiacal signs of the Greeks; and taking into consideration the analogy, though not identity, of the Ptolemaic system, or rather that of Hipparchus, and the Indian one of excentric deferents and epicycles, which in both serve to account for the irregularities of the planets, or at least to compute them; no doubt can be entertained that the Hindus received hints from the astronomical schools of the Greeks.

It must then be admitted to be at least possible, if not probable, in the absence of direct evidence and positive proof, that the imperfect algebra of the Greeks, which had advanced in their hands no further than the solution of equations, involving one unknown term, as it is taught by Diophantus, was made known to the Hindus by their Grecian instructors in improved astronomy. But, by the [450] ingenuity of the Hindu scholars, the hint was rendered fruitful, and the algebraic method was soon ripened from that slender beginning to the advanced state of a well-arranged science, as it was taught by Áryabhaṭṭa, and as it is found in treatises compiled by Brahmagupta and Bháskara, of both which versions are here presented to the public.

[1] See page 361, etc., of the present volume. [2] Note O.

NOTES AND ILLUSTRATIONS.

A.

Scholiasts of Bháskara.

The oldest commentary of ascertained date which has come into the translator's hands, and has been accordingly employed by him for the purpose of collation, as well as in the progress of translation, is one composed by Gangádhara, son of Gobardhana, and grandson of Divákara, inhabitant of Jambusara.[1] It appears, from an example of an astronomical computation which it exhibits,[2] to have been written about the year 1342 Śaka (A.D. 1420). Though confined to the Lílávatí, it expounds and consequently authenticates a most material chapter of the Víja-gaṇita, which recurs nearly verbatim in both treatises; but is so essential a part of the one, as to have given name to the algebraic analysis in the works of the early writers.[3] His elder brother Vishṇu-paṇ[451]ḍita was author of a treatise of arithmetic, etc., named Gaṇita-sára, a title borrowed from the compendium of Śrídhara. It is frequently quoted by him.

The next commentary in age, and consequent importance for the objects now under consideration, is that of Súryasúri, also named Súryadása, native of Párthapura, near the confluence of the Godá and Vidarbhá rivers.[4] He was author of a complete commentary on the Siddhánta-śiromaṇi; and of a

[1] A town situated in Gujrát (Gurjara), twenty-eight miles north of the town of Broach.

[2] Líl. § 264.

[3] Kuṭṭakádhyáya, the title of Brahmagupta's chapter on algebra, and of a chapter in Áryabhaṭṭa's work.

[4] Godávarí and Wardá.

distinct work on calculation, under the title of Gaṇita-málatí; and of a compilation of astronomical and astrological doctrines, Hindu and Muhammadan, under the name of Siddhánta-sanhitá-sára-samuchchaya, in which he makes mention of his commentary on the Śiromaṇi. The gloss on the Lílávatí, entitled Gaṇitámṛita, and that on the Víja-gaṇita, named Súrya-prakáśa, both excellent works, containing a clear interpretation of the text, with a concise explanation of the principles of the rules, are dated the one in 1460, the other in 1463 Śaka; or A.D. 1538 and 1541. His father Jnánarája, son of Nágonátha, a Bráhman and astronomer, was author, among other works, of an astronomical course, under the title of Siddhánta-sundara, still extant,[1] which, like the Siddhánta-śiromaṇi, comprises a treatise on algebra. It is repeatedly cited by his son.

Gaṇeśa, son of Keśava, a distinguished astronomer, native of Nandi-gráma, near Devagiri (better known by the Muhammadan name of Daulatábád),[2] was author of a commentary on the Siddhánta-śiromaṇi, which is mentioned by his nephew and scholiast Nṛisinha, in an [452] enumeration of his works, contained in a passage quoted by Viśwanátha on the Grahalághava. His commentary on the Lílávatí bears the title of Buddhivilásiní, and date of 1467 Śaka, or A.D. 1545. It comprises a copious exposition of the text, with demonstrations of the rules; and has been used throughout the translation as the best interpreter of it. He, and his father Keśava, and nephew Nṛisinha, as well as his cousin Lakshmídása, were authors of numerous works both on astronomy and divination. The most celebrated of his own performances, the Grahalághava, bears date 1442 Śaka, answering to A.D. 1520.

The want of a commentary by Gaṇeśa on the Víja-gaṇita, is supplied by that of Kṛishṇa, son of Ballála, and pupil of

[1] The astronomical part is in the library of the East-India Company.

[2] Nandigrám retains its ancient name, and is situated west of Daulatábád, about sixty-five miles.

Vishṇu, the disciple of Gaṇeśa's nephew Nṛisinha. It contains a clear and copious exposition of the sense, with ample demonstrations of the rules, much in the manner of Gaṇeśa, on the Lílávatí; whom also he imitated in composing a commentary on that treatise, and occasionally refers to it. His work is entitled Kalpalatávatára. Its date is determined at the close of the sixteenth century of the Christian era, by the notice of it and of the author in a work of his brother Ranganátha, dated 1524 Śaka (A.D. 1602), as well as in one by his nephew Muníśwara. He appears to have been astrologer in the service of the Emperor Jahángír, who reigned at the beginning of the seventeenth century.

The gloss of Ranganátha on the Vásaná, or demonstratory annotations of Bháskara, which is entitled Mitabháshiṇí, contains no specification of date; but is determined, with sufficient certainty, towards the middle of the sixteenth century of the Śaka era, by the writer's relation of son to Nṛisinha, the author of a commentary on the Súrya-siddhánta, dated 1542 Śaka, and of the Vásaná-[453]várttika (or gloss on Bháskara's annotations of the Śiromaṇi), which bears date in 1543 Śaka, or A.D. 1621; and his relation of brother, as well as pupil, to Kamalákara, author of the Siddhánta-tattwa-viveka, also composed towards the middle of the same century of the Śaka era. Nṛisinha, and his uncle Viśwanátha, author of astrological commentaries, describe their common ancestor Divákara, and his grandfather Ráma, as Maháráshṭra Bráhmans, living at Golagráma,[1] on the northern bank of the Godávarí, and do not hint a migration of the family. Nṛisinha's own father, Kṛishṇa, was author of a treatise on algebra in compendious rules (*sútra*), as his son affirms.

The Víja-prabodha, a commentary on the Víja-gaṇita, by Rámakṛishṇa, son of Lakshmaṇa, and grandson of Nṛisinha, inhabitant of Amarávatí,[2] is without date or express in-

[1] Golgám of the maps, in lat. 18° N. long. 78° E.
[2] A great commercial town in Berár.

dication of its period; unless his grandfather Nṛisinha be the same with the nephew of Viśwanátha just now mentioned; or else identified with the nephew of Gaṇeśa and preceptor of Vishṇu, the instructor of Kṛishṇa, author of the Kalpalatávatára. The presumption is on either part consistent with proximity of country: Amarávatí not being more than 150 miles distant from Nandigráma, nor more than 200 from Golagráma. It is on one side made probable by the author's frequent reference to a commentary of his preceptor Kṛishṇa, which in substance corresponds to the Kalpalatávatára; but the title differs, for he cites the Navánkura. On the other side it is to be remarked, that Kṛishṇa, father of the Nṛisinha, who wrote the Vásaná-várttika, was author of a treatise on algebra, which is mentioned by his son, as before observed.

The Manoranjana, another commentary on the Lílávatí, [454] which has been used in the progress of the translation, bears no date, nor any indication whatsoever of the period when the author Rámakṛishṇadeva, son of Sadádeva, surnamed Apadeva, wrote.

The Gaṇita-kaumudí, on the Lílávatí, is frequently cited by the modern commentators, and in particular by Súryasúri and Ranganátha; but has not been recovered, and is only known from their quotations.

Of the numerous commentaries on the astronomical portion of Bháskara's Siddhánta-śiromaṇi, little use having been here made, either for settling the text of the algebraic and arithmetical treatises of the author, or for interpreting particular passages of them, a reference to two commentaries of this class, besides those of Súryasúri and Gaṇeśa (which have not been recovered), and the author's own annotations, and the interpretation of them by Nṛisinha above noticed, may suffice: *viz.* the Gaṇita-tattwa-chintámaṇi, by Lakshmídása, grandson of Keśava (probably the same with the father of Gaṇeśa before mentioned), and son of Váchaspati, dated 1423 Śaka

(A.D. 1501); and the Máricha, by Munísvara, surnamed Viśwarúpa, grandson of Ballála, and son of Ranganátha, who was compiler of a work dated 1524 Śaka (A.D. 1620), as before mentioned. Munísvara himself is the author of a distinct treatise of astronomy entitled Siddhánta-sárva-bhauma.

Persian versions of both the Lílávatí and Víja-gaṇita have been already noticed, as also contributing to the authentication of the text. The first by Faizí, undertaken by the command of the Emperor Akbar, was executed in the 32nd year of his reign, A.H. 995 (A.D. 1587). The translation of the Víja-gaṇita is later by half a century, having been completed by 'Atá Ullah Rashídí, in the 8th year of the reign of Sháh Jahán, A.H. 1044, A.D. 1634.

B.

Astronomy of Brahmagupta.

[455] Brahmagupta's entire work comprises twenty-one lectures or chapters; of which the ten first contain an astronomical system, consisting (1st and 2nd) in the computation of mean motions and true places of the planets; 3rd, solution of problems concerning time, the points of the horizon, and the position of places; 4th and 5th, calculation of lunar and solar eclipses; 6th, rising and setting of the planets; 7th, position of the moon's cusps; 8th, observation of altitudes by the gnomon; 9th, conjunctions of the planets; and, 10th, their conjunction with stars. The next ten are supplementary, including five chapters of problems with their solutions: and the twenty-first explains the principles of the astronomical system in a compendious treatise on spherics, treating of the astronomical sphere and its circles, the construction of sines, the rectification of the apparent planet from mean motions,

the cause of lunar and solar eclipses, and the construction of the armillary sphere.[1]

The copy of the scholia and text, in the translator's possession, wants the whole of the 6th, 7th, and 8th chapters, and exhibits gaps of more or less extent in the preceding five; and appears to have been transcribed from an exemplar equally defective. From the middle of the 9th, to near the close of the 15th chapters, is an uninterrupted and regular series, comprehending a very curious chapter, the 11th, which contains a revision and censure of earlier writers: and next to it the chapter on arithmetic and mensuration, which is the 12th of the work. It is followed in the 13th, and four succeeding chapters, by solutions of problems concerning mean and true motions of planets, finding of [456] time, place, and points in the horizon; and relative to other matters, which the defect of the two last of five chapters renders it impracticable to specify. Next comes (but in a separate form, being transcribed from a different exemplar) the 18th chapter on Algebra. The two which should succeed (and one of which, as appears from a reference to a chapter on this subject, treats of the various measures of time under the several denominations of solar, sidereal, lunar, etc.; and the other, from like references to it, is known to treat of the delineation of celestial phænomena by diagram,) are entirely wanting, the remainder of the copy being defective. The twenty-first chapter, however, which is last in the author's arrangement (as the corresponding book on spherics of Bháskara's Siddhánta-śiromaṇi is in his), has been transposed and first expounded by the scholiast: and very properly so, since its subject is naturally preliminary, being explanatory of the principles of astronomy. It stands first in the copy under consideration; and is complete, except one or two initial couplets.

[1] [Albírúní gives a complete table of the chapters of the Brahma-siddhánta. Reinaud's *Mémoire*, p. 334.]

C.

Brahma-siddhánta, title of Brahmagupta's Astronomy.

The passage is this: "*Brahmokta-graha-gaṇitam mahatá kálena yat khilí-bhútam, abhidhíyate* sphuṭam *tat Jishṇu-suta-Brahmaguptena.*"

'The computation of planets, taught by Brahma, which had become imperfect by great length of time, is propounded correct by Brahmagupta, son of Jishṇu.'

The beginning of Pṛithúdaka's commentary on the Brahma-siddhánta, where the three initial couplets of the text are expounded, being deficient, the quotation cannot at present be brought to the test of collation. But the title is still more expressly given near the close of the [457] eleventh chapter (§ 59) "*Bráhme sphuṭa-siddhánte* ravíndu-bhú-yogam, etc."

And again (§ 61) "*Chandra-ravi-grahaṇendu-chháyádishu sarvadá yato Bráhme, dṛig-gaṇitaikyam bhavati*, sphuṭa-siddhántas *tato* Bráhmaḥ." 'As observation and computation always agree in respect of lunar and solar eclipses, moon's shadow (*i. e.* altitude), and other particulars, according to the Bráhma, therefore is the Bráhma a correct system (*sphuṭa-siddhánta*).'

It appears from the purport of these several passages compared, that Brahmagupta's treatise is an emendation of an earlier system (bearing the same name of Bráhma-siddhánta, or an equivalent title, as Pitámaha-siddhánta, or adjectively Paitámaha), which had ceased to agree with the phænomena, and into which requisite corrections were therefore introduced by him to reconcile computation and observation; and he entitled his amended treatise 'Correct Brahma-siddhánta.' That earlier treatise is considered to be the identical one which is introduced into the Vishṇu-

dharmottara-puráṇa, and from which parallel passages are accordingly cited by the scholiasts of Bháskara. (See following note.) It is no doubt the same which is noticed by Varáhamihira under the title of Paitámaha and Bráhmasiddhánta. Couplets, which are cited by his commentator Bhaṭṭotpala from the Brahma-siddhánta, are found in Brahmagupta's work. But whether the original or the amended treatise be the one to which the scholiast referred, is nevertheless a disputable point, as the couplets in question may be among passages which Brahmagupta retained unaltered.

D.

Verification of the Text of Brahmagupta's Treatise of Astronomy.

[458] A passage, referring the commencement of astronomical periods and of planetary revolutions to the supposed instant of the creation, is quoted from Brahmagupta, with a parallel passage of another Brahma-siddhánta (comprehended in the Vishṇu-dharmottara-puráṇa), in a compilation by Muníśwara, one of Bháskara's glossators.[1] It is verified as the 4th couplet of Brahmagupta's first chapter (upon mean motions) in the translator's copy.

Seven couplets, specifying the mean motions of the planets' nodes and apogees, are quoted after the parallel passage of the other Brahma-siddhánta, by the same scholiast of Bháskara, as the text of Brahmagupta; and they are found in the same order from the 15th to the 21st in the first chapter of his work in the copy above mentioned.

This commentator, among many other corresponding passages noticed by him on various occasions, has quoted one from the same Brahma-siddhánta of the Vishṇu-dharmottara concerning

[1] As. Res., vol. xii. p. 232 (p. 348 of the present volume).

the orbits of the planets deduced from the magnitude of the sky computed there, as it also is by Brahmagupta (ch. 21, § 9), but in other words, at a circumference of 18,712,069,200,000,000 *yojanas*. He goes on to quote the subsequent couplet of Brahmagupta, declaring that planets travel an equal measured distance in their orbits in equal times; and then cites his scholiast (*ṭíkákára*) Chaturvedáchárya.

The text of Brahmagupta (ch. 1, § 21), specifying the diurnal revolutions of the sidereal sphere, or number of [459] sidereal days in a *kalpa*, with the correspondent one of the Paitámaha-siddhánta in the Vishṇu-dharmottara, is another of the quotations of the same writer in his commentary on Bháskara.

A passage relating to oval epicycles,[1] cited by the same author in another place, is also verified in the 2nd chapter (in the rectification of a planet's place).

A number of couplets on the subject of eclipses[2] is cited by Lakshmídása, a commentator of Bháskara. They are found in the 5th chapter (on eclipses), § 10 and 24; and in a section of the 21st (on the cause of eclipses), § 37 to 46, in the copy in question.

Several couplets, relating to the positions of the constellations and to the longitudes and latitudes of principal fixt stars, are cited from Brahmagupta in numerous compilations, and specifically in the commentaries on the Súrya-siddhánta and Siddhánta-śiromaṇi.[3] They are all found correct in the 10th chapter, on the conjunctions of planets with fixt stars.

A quotation by Gaṇeśa on the Lílávatí (A.D. 1545), describing the attainments of a true mathematician,[4] occurs with exactness as the first couplet of the 12th chapter, on arithmetic; and one adduced by Bháskara himself, in his arithmetical treatise (§ 190), giving a rule for finding the diagonal of a trapezium,[5] is precisely the 28th of the same chapter.

[1] Page 352, etc., of the present volume.
[2] Page 357 of the present volume.
[3] Page 283, etc., of the present volume.
[4] Líl. ch. 11.
[5] Líl. § 190.

A very important passage, noticed by Bháskara in his notes on his Siddhánta-śiromaṇi, and alluded to in his text, and fully quoted by his commentator in the Márícha, relative to the rectification of a planet's true place from the [460] mean motions,[1] is found in the 21st chapter, § 27. Bháskara has, on that occasion, alluded to the scholiast, who is accordingly quoted by name in the commentary of Lakshmídása (A.D. 1501): and here again the correspondence is exact.

The identity of the text as Brahmagupta's, and of the gloss as his scholiast's, being (by these and many other instances which have been collated) satisfactorily established; as the genuineness of the text is by numerous quotations from the Brahma-siddhánta (without the author's name) in the more ancient commentary of Bhaṭṭotpala (A.D. 968) on the works of Varáhamihira, which also have been verified in the mutilated copy of the Brahma-siddhánta under consideration; the next step was the examination of the detached copy of a commentary on the 18th chapter, upon algebra, which is terminated by a colophon so describing it, and specifying the title of the entire book Brahma-siddhánta, and the name of its author Brahmagupta.

For this purpose materials are happily presented in the scholiast's enumeration, at the close of the chapter on arithmetic, of the topics treated by his author in the chapter on algebra, entitled *Kuṭṭaka:*[2] in a general reference to the author's algorithm of unknown quantities, affirmative and negative terms, cipher and surd roots, in the same chapter;[3] and the same scholiast's quotations of the initial words of four rules; one of them relative to surd roots;[4] the other three regarding the resolution of quadratic equations:[5] as also in the references of the scholiast of the [461] algebraic treatise to passages in the astronomical part of his author's work.[6]

[1] Page 354, etc., of the present volume.
[2] Arithm. of Brahm. § 66.
[3] Arith. of Brahm. § 13.
[4] Arithm. of Brahm. § 39.
[5] Arithm. of Brahm. § 15 and 18.
[6] Alg. of Brahm. § 96 (Rule 55).

The quotations have been verified: and they exactly agree with the rule concerning surds (§ 26) and the three rules which compose the section relating to quadratic equations (§ 32–34); and with the rule in the chapter on the solution of astronomical problems concerning mean motions (ch. 13, § 22): and this verification and the agreement of the more general references demonstrate the identity of this treatise of algebra, consonantly to its colophon, as Brahmagupta's algebra entitled *Kuṭṭaka* and a part of his Brahma-siddhánta.

E.

Chronology of Astronomical Authorities according to Astronomers of Ujjayaní.

The names of astronomical writers with their dates, as furnished by the astronomers of Ujjayaní, who were consulted by Dr. William Hunter, sojourning there with a British embassy, are the following:—

	Varáhamihira	122 S'aka	[A.D. 200–1]
Another	Varáhamihira	427	[A.D. 505–6]
	Brahmagupta	550	[A.D. 628–9]
	Munjála	854	[A.D. 932–3]
	Bhaṭṭotpala	890	[A.D. 968–9]
	S'wetotpala	939	[A.D. 1017–8]
	Varuṇa-bhaṭṭa	962	[A.D. 1040–1]
	Bhoja-rája	964	[A.D. 1042–3]
	Bháskara	1072	[A.D. 1150–1]
	Kalyáṇachandra	1101	[A.D. 1179–80]

The grounds on which this chronology proceeds are unexplained in the note which Dr. Hunter preserved of the communication; but means exist for verifying two of the dates specified and corroborating others.[1]

[1] [According to Albírúní, who wrote in 1031, the Hindus then reckoned 526 years since the composition of the Pancha-siddhánta of Varáhamihira, 366 years for the Kanda-kátaka tables [Khaṇḍa-khádya-karaṇa ?] of Brahmagupta, and 132 years for the Karaṇa-sára of Bháskara [cf. *infrà*, p. 423 ?] thus making Varáhamihira flourish in A.D. 504, Brahmagupta in A.D. 664, and Bháskara [?] in 898. (Reinaud, *Mémoire*, p. 337.)]

[462] The date assigned to Bháskara is precisely that of his Siddhánta-śiromaṇi, plainly concluded from a passage of it, in which he declares that it was completed by him, being thirty-six years of age; and that his birth was in 1036 Śaka.

Rájá Bhoja-deva, or Bhoja-rája, is placed in this list of Hindu astronomers apparently on account of his name being affixed, as that of the author, to an astrological treatise on the calendar, which bears the title of Rája-mártaṇḍa, and which was composed probably at his court and by astrologers in his service. It contains no date; or at least none is found in the copy which has been inspected. But the age assigned to the prince is not inconsistent with Indian History: and is supported by the colophon of a poem entitled Subháshita-ratna-sandoha, composed by a Jaina sectary named Amitagati, who has given the date of his poem in 1050 of Vikramáditya, in the reign of Munja. Now Munja was uncle and predecessor of Bhoja-rája, being regent, with the title of sovereign, during his nephew's minority: and this date, which answers to A.D. 993–4, is entirely consistent with that given by the astronomers of Ujjayaní, viz. 964 Śaka, corresponding to A.D. 1042–3: for the reign of Bhoja-deva was long; extending, at the lowest computation, to half a century, and reaching, according to an extravagant reckoning, to the round number of an hundred years.

The historical notices of this King of Dhárá[1] are examined by Major Wilford and Mr. Bentley in the ninth and eighth volumes of Asiatic Researches: and they refer him to the tenth century of the Christian era, the one making him ascend the throne in A.D. 982; the other in A.D. 913. The former, which takes his reign [463] at an entire century, including of course his minority, or the period of the administration, reign, or regency, of his uncle Munja, is compatible with the date of Amitagati's poem (A.D. 993), and with that of the Rája-mártaṇḍa or other astrological and astronomical works ascribed

[1] The modern *Dhár*. Wilford, As. Res.

to him (A.D. 1042), according to the chronology of the astronomers of Ujjayaní.

The age assigned to Brahmagupta is corroborated by the arguments adduced in the text. That given to Munjála is consistent with the quotation of him as at the head of a tribe of authors, by Bháskara, at the distance of two centuries. The period allotted to Varáhamihira, that is, to the second and most celebrated of the name, also admits corroboration. This point, however, being specially important to the history of Indian astronomy, and collaterally to that of the Hindu algebra, deserves and will receive a full and distinct consideration.

F.

Age of Brahmagupta inferred from Astronomical data.[1]

The star Chitrá, which unquestionably is Spica Virginis,[2] was referred by Brahmagupta to the 103rd degree counted from its origin to the intersection of the star's circle of declination;[3] whence the star's right ascension is deduced 182° 45′. Its actual right ascension in A.D. 1800 was 198° 40′ 2″.[4] The difference, 15° 55′ 2″, is the quantity by which the beginning of the first zodiacal asterism and lunar mansion, Aświní, as inferrible from the position of the star Chitrá, has receded from the equinox: and it indicates [464] the lapse of 1216 years (to A.D. 1800), since that point coincided with the equinox; the annual precession of the star being reckoned at 47″, 14.[5]

The star Revatí, which appears to be ζ Piscium,[6] had no

[1] [Cf. Prof. Whitney, Journ. A.O.S. viii. p. 93.]

[2] Page 296 of the present volume.

[3] Pages 283, etc. and 356 of the present volume.

[4] Zach's Tables for 1800 deduced from Maskelyne's Catalogue.

[5] Maskelyne's Catalogue: the mean precession of the equinoctial points being reckoned 50″, 3.

[6] Page 302 of the present volume.

longitude, according to the same author, being situated precisely at the close of the asterism and commencement of the following one, Aświní, without latitude or declination, exactly in the equinoctial point. Its actual right ascension in 1800 was 15° 49′ 15.″[1] This, which is the quantity by which the origin of the Indian ecliptic, as inferrible from the position of the star Revatí, has receded from the equinox, indicates a period of 1221 years elapsed to the end of the eighteenth century; the annual precession for that star being 46″, 63.[2]

The mean of the two is 1218½ years; which, taken from 1800, leave 581 or 582 of the Christian era. Brahmagupta then appears to have observed and written towards the close of the sixth, or the beginning of the following century; for, as the Hindu astronomers seem not to have been very accurate observers, the belief of his having lived and published in the seventh century, about A.D. 628, which answers to 550 Śaka, the date assigned to him by the astronomers of Ujjayaní, is not inconsistent with the position, that the vernal equinox did not sensibly to his view deviate from the beginning of Aries or Mesha, as determined by him from the star Revatí (ζ Piscium), which he places at that point.

The same author assigns to Agastya or Canopus a distance of 87°, and to Lubdhaka or Sirius 86°, from the [465] beginning of Mesha. From these positions a mean of 1280 years is deducible.

The passage in which this author denies the precession of the colures, as well as the comment of his scholiast on it, being material to the present argument, they are here subjoined in a literal version.

'The very fewest hours of night occur at the end of Mithuna, and the seasons are governed by the sun's motion; therefore the pair of solstices appears to be stationary, by the evidence of a pair of eyes.'[3]

Scholia: 'What is said by Vishṇuchandra at the begin-

[1] Zach's Tables. [2] Zach's Tables. [3] Brahma-siddhánta, ii. § 54.

ning of the chapter on the *yuga* of the solstice ("Its revolutions through the asterisms are here [in the *kalpa*] a hundred and eighty-nine thousand four hundred and eleven. This is termed a *yuga* of the solstice, as of old admitted by Brahma, Arka, and the rest.") is wrong: for the very fewest hours of night to us occur when the sun's place is at the end of Mithuna [Gemini]; and of course the very utmost hours of day are at the same period. From that limitary point, the sun's progress regulates the seasons; namely, the cold season (*śiśira*) and the rest, comprising two months each, reckoned from Makara [Capricorn]. Therefore what has been said concerning the motion of the limitary point is wrong, being contradicted by actual observation of days and nights.

'The objection, however, is not valid: for now the greatest decrease and increase of night and day do not happen when the sun's place is at the end of Mithuna: and passages are remembered, expressing "The southern road of the sun was from the middle of Áśleshá; and the northern one at the beginning of Dhanishṭhá;"[1] and [466] others [of like import]. But all this only proves, that there is a motion; not that the solstice has made many revolutions through the asterisms.'[2]

It was hinted at the beginning of this note, that Brahmagupta's longitude (*dhruvaka*) of a star is the arc of the ecliptic intercepted by the star's circle of declination, and counted from the origin of the ecliptic at the beginning of Mesha; as his latitude (*vikshepa*) of a star is the star's distance on a circle of declination from its point of intersection with the ecliptic. In short, he, like other Hindu astronomers, counts longitude and latitude of stars by the intersection of circles of declination with the ecliptic. The subject has been before noticed.[3] To make it more clear, an instance may be taken: and that of the scholiast's computation of the zenith

[1] This quotation is from Varáhamihira's *sanhitá*, ch. 3, § 1 and 2.

[2] Pṛithúdaka-swámí-chaturveda on Brahm.

[3] Pages 285, etc., and 357 of the present volume.

distance and meridian altitude of Canopus for the latitude of Kanyakubja (Kanouj) may serve as an apposite example.

From the *vikshepa* of the star A'gastya, 77°, he subtracts the declination of the intersected point of the ecliptic 23° 58′; to the remainder, which is the declination of the star, 53° 2′, he adds the latitude of the place, 26° 35′; the sum, 79° 37′, is the zenith distance; and its complement to ninety degrees, 10° 23′, is the meridian altitude of the star.[1]

The annual variation of the star in declination, 1″, 7, is too small to draw any inference as to the age of the scholiast from the declination here stated. More especially as it is taken from data furnished by his author; and as he appears to have been, like most of the Hindu astronomers, no very accurate observer; the latitude assigned by him to [467] the city in which he dwelt being no less than half a degree wrong: for the ruins of the city of Kanouj are in 27° 5′ N.

G.

A'RYABHAṬṬA'S DOCTRINE.

A'ryabhaṭṭa was author of the A'ryáshṭaśata (800 couplets[2]) and Daśagítiká (ten stanzas), known by the numerous quotations of Brahmagupta, Bhaṭṭotpala, and others, who cite both under these respective titles. The Laghu A'rya-siddhánta, as a work of the same author, and, perhaps, one of those above mentioned,[3] is several times quoted by Bháskara's commentator Muníśwara. He likewise treated of algebra, etc. under the distinct heads of *Kuṭṭaka*, a problem serving for the resolution of indeterminate ones, and *Víja*, principle of computation, or analysis in general.—*Líl.* c. 11.

From the quotations of writers on astronomy, and par-

[1] Pṛithúdaka-swámí on Brahm., ch. 10. § 35. [2] [Rather 108 couplets.]

[3] [Cf. Dr. Bháu Dájí, J.R.A.S., 1864, p. 399, and Prof. Kern, *Vṛihat Sanh.* pref. p. 56.]

ticularly of Brahmagupta, who, in many instances, cites Áryabhaṭṭa to controvert his positions (and is in general contradicted in his censure by his own scholiast Pṛithúdaka, either correcting his quotations, or vindicating the doctrine of the earlier author), it appears that Áryabhaṭṭa affirmed the diurnal revolution of the earth on its axis, and that he accounted for it by a wind or current of aerial fluid, the extent of which, according to the orbit assigned to it by him, corresponds to an elevation of little more than a hundred miles from the surface of the earth: that he possessed the true theory of the causes of lunar and solar eclipses, and disregarded the imaginary dark planets of the mythologists and astrologers, affirming the moon and primary planets (and even the stars) to be essentially dark, and only illumined by the sun: that he [468] noticed the motion of the solstitial and equinoctial points, but restricted it to a regular oscillation, of which he assigned the limit and the period: that he ascribed to the epicycles, by which the motion of a planet is represented, a form varying from the circle and nearly elliptic: that he recognized a motion of the nodes and apsides of all the primary planets, as well as of the moon; though in this instance, as in some others, his censurer imputes to him variance of doctrine.

The magnitude of the earth, and extent of the encompassing wind, is among the instances wherein he is reproached by Brahmagupta with versatility, as not having adhered to the same position throughout his writings; but he is vindicated on this, as on most occasions, by the scholiast of his censurer. Particulars of this question, leading to rather curious matter, deserve notice.

Áryabhaṭṭa's text specifies the earth's diameter, 1050 *yojanas;* and the orbit or circumference of the earth's wind [spiritus vector] 3393 *yojanas;* which, as the scholiast rightly argues, is no discrepancy. The diameter of this orbit, according to the remark of Brahmagupta, is 1080.

On this it is to be in the first place observed, that the proportion of the circumference to the diameter of a circle, here employed, is that of 22 to 7; which not being the same which is given by Brahmagupta's rule (Arithm. § 40), must be presumed to be that which Áryabhaṭṭa taught. Applying it to the earth's diameter as by him assigned, *viz.* 1050, the circumference of the earth is 3300; which evidently constitutes the dimensions by him intended: and that number is accordingly stated by a commentator of Bháskara. See Gaṇ. on *Lil.* § 4.

This approximation to the proportion of the diameter of a circle to its periphery, is nearer than that which both [469] Brahmagupta and Śrídhara, though later writers, teach in their mensuration, and which is employed in the Súrya-siddhánta; namely, one to the square root of ten. It is adopted by Bháskara, who adds, apparently from some other authority, the still nearer approximation of 1250 to 3927.—*Lil.* § 201.

Áryabhaṭṭa appears, however, to have also made use of the ratio which afterwards contented both Brahmagupta and Śrídhara; for his rule, adduced by Gaṇeśa (*Lil.* § 207), for finding the arc from the chord and versed sine, is clearly founded on the proportion of the diameter to the periphery, as one to the square root of ten: as will be evident if the semicircle be computed by that rule: for it comes out the square root of $\frac{10}{4}$, the diameter being 1.

A more favourable notion of his proficiency in geometry—a science, however, much less cultivated by the Hindus than algebra—may be received from his acquaintance with the theorem containing the fundamental property of the circle, which is cited by Pṛithúdaka.—Brahm. 12, § 21.

The number of 3300 *yojanas* for the circumference of the earth, or $9\frac{1}{6}$ *yojanas* for a degree of a great circle, is not very wide of the truth, and is, indeed, a very near approach, if the *yojana*, which contains four *krośas*, be rightly inferred from

the modern computed *kroša* found to be 1, 9 B. M.[1] For, at that rate of 7, 6 miles to a *yojana*, the earth's circumference would be 25,080 B. miles.

The difference between the diameter of the earth and that of its air (*váyu*), by which term Áryabhaṭṭa seems to intend a current of wind whirling as a vortex, and causing the earth's revolution on its axis, leaves 15 *yojanas*, or [470] 114 miles, for the limit of elevation of this atmospheric current.

H.

Scantiness of the Additions by later Writers on Algebra.

The observation in the text on the scantiness of the improvements or additions made to the algebra of the Hindus in a long period of years after Áryabhaṭṭa probably, and after Brahmagupta certainly, is extended to authors whose works are now lost, on the faith of quotations from them. Śrídhara's rule, which is cited by Bháskara (Víj.-gaṇ. § 131), concerning quadratics, is the same in substance with one of Brahmagupta's (ch. 18, § 32–33). Padmanábha, indeed, appears from the quotation from his treatise (Víj.-gaṇ. § 142) to have been aware of quadratic equations affording two roots; which Brahmagupta has not noticed; and this is a material accession which the science received. There remains an uncertainty respecting the author, from whom Bháskara has taken the resolution of equations of the third and fourth degrees in their simple and unaffected cases.

The only names of algebraists who preceded Bháskara, to be added to those already mentioned, are, 1st, an earlier writer of the same name (Bháskara), who was at the head of the commentators of Áryabhaṭṭa; and, 2nd, the elder scholiast of

[1] As. Res., vol. v. p. 105.

the Brahma-siddhánta, named Bhaṭṭa-balabhadra. Both are repeatedly cited by the successor of the latter in the same task of exposition, Pṛithúdaka-swámí, who was himself anterior to the author of the Śiromaṇi, being more than once quoted by him. As neither of those earlier commentators is named by the younger Bháskara, nor any intimation given of his having consulted and employed other treatises besides [471] the three specified by him in the compilation of the Víja-gaṇita, it is presumable, that the few additions, which a comparison with the Kuṭṭaka of Brahmagupta exhibits, are properly ascribable either to Śrídhara or to Padmanábha: most likely to the latter, as he is cited for one such addition;[1] and as Śrídhara's treatise of arithmetic and mensuration, which is extant, is not seemingly the work of an author improving on the labours of those who went before him.[2] The corrections and improvements introduced by Bháskara himself, and of which he carefully apprizes his readers,[3] are not very numerous, nor in general important.[4]

I.

Age of Áryabhaṭṭa.[5]

Under the Abbasside Khalifs Almansúr and Almámún, in the middle of the eighth and beginning of the ninth centuries

[1] *Víj.-gaṇ.* § 142.

[2] *Líl.* § 147. Brahm. c. 12, § 21 and 40. *Gaṇ. Sár.* § 126.

[3] *Víj.-gaṇ.* before § 44, and after § 57, also ch. 1, towards the end; and ch. 5, § 142.

[4] Unless *Líl.* § 170 and 190.

[5] [Áryabhaṭa (as the name is more correctly spelt) is now known to have been born A.D. 476 (see Dr. Bháu Dájí's paper, J.R.A.S. 1864). We have, of his works, the *Daśagíti* in twelve stanzas, two of which contain only the invocation and colophon, and the *Áryabhaṭa-siddhánta* or *Áryabhaṭíya* in 111 stanzas; but if we omit the three invocatory and closing stanzas, we get 108, i.e. *Áryáshṭaśata* (see Prof. Kern's introduction to his edition of Varáhamihira's *Vṛihat Sanhitá*, pp. 55–59). The *Mahá-siddhánta* belongs to a later Áryabhaṭa, cf. *Vṛihat Sanh.* pref. p. 60.]

of the Christian era, the Arabs became conversant with the Indian astronomy. It was at that period, as may be presumed, that they obtained information of the existence and currency of three astronomical systems among the Indians;[1] one of which bore the name of Áryabhaṭṭa, or, as written in Arabic characters, Árjabahar[2] (perhaps [472] intended for Árjabhar), which is as near an approximation as the difference of characters can be expected to exhibit. This then unquestionably was the system of the astronomer whose age is now to be investigated; and who is in a thousand places cited by Hindu writers on astronomy, as author of a system and founder of a sect in this science. It is inferred from the acquaintance of the Arabs with the astronomical attainments of the Hindus, at that time, when the court of the Khalif drew the visit of a Hindu astrologer and mathematician, and when the Indian determination of the mean motions of the planets was made the basis of astronomical tables compiled by order of the Khalifs, 'for a guide in matters pertaining to the stars,' and when Indian treatises on the science of numbers were put in an Arabic dress; adverting also to the difficulty of obtaining further insight into the Indian sciences, which the author of the Táríkhu'l hukamá complains of, assigning for the cause the distance of countries, and the various impediments to intercourse: it is inferred, we say, from these, joined to other considerations, that the period in question was that in which the name of Áryabhaṭṭa was introduced to the knowledge of the Arabs. This, as a first step in inquiring the antiquity of this author, ascertains his celebrity as an astronomical authority above a thousand years ago.

He is repeatedly named by Hindu authors of a still earlier date: particularly by Brahmagupta, in the first part of the

[1] *Táríkhu'l hukamá*, or Bibl. Arab. Phil. quoted by Casiri: Bibl. Arab. Hisp. vol. i. p. 426. See note M.

[2] Cossali's Argebakr is a misprint (Orig. etc., dell' Alg. vol. i. p. 207). Casiri gives, as in the Arabic, Argebahr: which, in the orthography here followed, is Arjabahr.

seventh century of the Christian era. He had been copied by writers whom Brahmagupta cites. Varáhamihira has allusions to him, or employs his astronomical determinations in an astrological work at the beginning of the sixth century. These facts will be further weighed upon as we proceed.

For determining Áryabhaṭṭa's age with the greater precision of astronomical chronology, grounds are pre[473]sented, at the first view promising, but on examination insufficient.

In the investigation of the question upon astronomical grounds, recourse was in the first place had to his doctrine concerning the precession of the equinoxes. As quoted by Muníśwara, a scholiast of Bháskara, he maintained an oscillation of the equinoctial points to twenty-four degrees on either side; and he reckoned 578,159 such librations in a *kalpa*.[1] From another passage cited by Bhaṭṭotpala on Varáhamihira,[2] his position of the mean equinoxes was the beginning of Aries and of Libra.[3] From one more passage quoted by the scholiast of Brahmagupta,[4] it further appears, that he reckoned 1,986,120,000 years expired[5] before the war of the Bhárata: and the duration of the *kalpa*, if he be rightly quoted by Brahmagupta,[6] is 1008 quadruple *yugas* of 4,320,000 years each.

From these data it follows that, according to him, the equinoctial point had completed 263,699 oscillations at the epoch of the war of the Bhárata. But we are without any information as to the progress made in the current oscillation when he wrote, or the actual distance of the equinox from the beginning of Mesha: the position of which, also, as by him received, is uncertain.

[1] Page 332 of the present volume.

[2] Vṛihat-sanhitá, ch. 2.

[3] 'From the beginning of Mesha to the end of Kanyá (Virgo), the half the ecliptic passes through the north. From the beginning of Tulá to the end of (the fishes) Mína, the remaining half passes by the south.'

[4] Pṛithúdaka on Brahm., c. i. § 10 and 30, and c. xi. § 4.

[5] Six *Manus*, twenty-seven *yugas* and three-quarters.

[6] Pṛithúdaka on Brahm., c. i. § 12.

His limit of the motion in trepidation, 24°, was evidently suggested to him by the former position of the colures declared by Paráśara; the exact difference being 23° 20′. [474] But the commencement of Paráśara's Áśleshá, in his sphere, or the origin of his sidereal Mesha, are unascertained. Whether his notions of the duodecimal division of the zodiac were taken from the Grecian or Egyptian spheres, or from what other immediate source, is but matter of conjecture.

Quotations of this author furnish the revolutions of Jupiter in a *yuga*,[1] and of Saturn's aphelion in a *kalpa*;[2] and those of the moon in the latter period: but the same passage,[3] in which the number of lunar revolutions in that great period are given, supplies those of the sun; namely 4,320,000,000; differing from the duration of the *kalpa* according to this author as cited by more ancient compilers. The truth is, as appears from another quotation,[4] that Áryabhaṭṭa, after delivering one complete astronomical system, proceeds in a second and distinct chapter to deliver another and different one as the doctrine of Paráśara; whose authority, he observes, prevails in the Kali age: and though he seems to indicate the *kalpa* as the same in both, he also hints that in one a deduction is made for the time employed in creation; and we have seen that the duration of the *kalpa* differs in the quotations of compilers from this author.

The ground then being insufficient, until a more definitive knowledge of either system, as developed by him, be recovered, to support any positive conclusion, recourse must be had, on failure of precise proof, to more loose presumption. It is to be observed, that he does not use the Śaka or Samvat of Vikramáditya, nor the Śaka era of Śáliváhana, but exclusively employs the epoch of the war of the Bhárata, which is the era of Yudhish[475]ṭhira and the same with the commencement of the Kali *yuga*. Hence it is to be argued, that

[1] As. Res., vol. iii. p. 215.

[2] Mun. on Bhás., c. i. § 33.

[3] Mun. on Bhás. c. i. § 16—18.

[4] *Várt.* and Mun. on Bhás.

he flourished before this era was superseded by the introduction of the modern epochas. Varáhamihira, on the other hand, does employ the Śaka, termed by him Śaka-bhúpa-kála and Śakendra-kála: which the old scholiast interprets 'the time when the barbarian kings called Śaka were discomfited by Vikramáditya:'[1] and Brahmagupta uses the modern Śaka era, which he expresses by Śaka-nṛipánte, interpreted by the scholiast of Bháskara 'the end [of the life or reign] of Vikramáditya, who slew a people of barbarians named Śakas.' Varáhamihira's epoch of Śaka appears to have been understood by his scholiast Bhaṭṭotpala to be the same with the era of Vikramáditya, which now is usually called Samvat, and which is reckoned to commence after 3044 years of the Kali age were expired:[2] and Brahmagupta's epoch of Śaka is the era of Śáliváhana, beginning at the expiration of 3179 years of the Kali *yuga*: and accordingly this number is specified in his Brahma-siddhánta. When those eras were first introduced is not at present with certainty known. If that of Vikramáditya, dating with a most memorable event of his reign, came into use during its continuance, still its introduction could not be from the first so general as at once and universally to supersede the former era of Yudhishṭhira. But the argument drawn from Áryabhaṭṭa's use of the ancient epoch, and his silence respecting the modern, so far as it goes, favours the presumption that he lived before the origin of the modern eras. Certainly he is anterior to Brahmagupta, who cites him in more than a hundred places by name: and to Varáhamihira, whose compilation is founded, among other authorities, on [476] the Romaka of Śrísheṇa, and Vásishṭha of Vishṇuchandra, which Brahmagupta affirms to be partly taken from Áryabhaṭṭa.[3] The priority of this author is explicitly asserted likewise by the celebrated astronomer

[1] Vṛihat-sanhitá.

[2] [Prof. Kern, in the preface to his ed. of Varáhamihira's Vṛihat-sanhitá, p. 6, considers that Bhaṭṭotpala meant the era of S'áliváhana.]

[3] Brahm. Siddh., c. 11, § 48—51.

Gaṇeśa, who, in explanation of his own undertaking, says: 'Rules framed by other holy sages were right in the *Tretá* and *Dwápara;* but, in the present age, Paráśara's. Áryabhaṭṭa, however, finding his imperfect, after great lapse of time, reformed the system. It grew inaccurate, and was therefore amended by Durgasinha, Mihira, and others. This again became insufficient: and correct rules were framed by the son of Jishṇu [Brahmagupta], founded upon Brahma's revelation. His system also, after a long time, came to exhibit differences. Keśava rectified it. Now, finding this likewise a little incorrect after sixty years, his son Gaṇeśa has perfected it, and reconciled computation and experience.'[1]

Áryabhaṭṭa then preceded Brahmagupta, who lived towards the middle of the sixth century of the Śaka era; and Varáhamihira, placed by the chronologers of Ujjayaní at the beginning of the fifth or of the second (for they notice two astronomers of the name). He is prior also to Vishṇuchandra, Śrísheṇa, and Durgasinha; all of them anterior to the second Varáhamihira; and an interval of two or of three centuries is not more than adequate to a series of astronomers following each other in the task of emendation, which process of time rendered successively requisite.

On these considerations it is presumed, that A'ryabhaṭṭa is unquestionably to be placed earlier than the fifth century of the Śaka: and probably so, by several (by [477] more than two or three) centuries: and not unlikely before the commencement of either Śaka or Samvat eras. In other words, he flourished some ages before the sixth century of the Christian era: and perhaps lived before, or, at latest, soon after its commencement. Between these limits, either the third or the fourth century might be assumed as a middle term. We shall, however, take the fifth of Christ as the latest period to which Áryabhaṭṭa can, on the most moderate assumption, be referred.

[1] Citation by Nṛisinha on Súr. Siddh.

K.

Writings and Age of Varáhamihira.

This distinguished astrological writer, a native of Ujjayaní, and son of A'dityadása,[1] was author of a copious work on astrology, compiled, and, as he declares, abridged from earlier writers. It is comprised in three parts: the first on astronomy; the second and third, on divination: together constituting a complete course. Such a course, he observes in his preface to the third part, has been termed by ancient writers Sanhitá, and consists of three *skandhas* or parts: the first, which teaches to find a planet's place by computation (*gaṇita*), is called *tantra;* the second, which ascertains lucky and unlucky indications, is named *horá;* it relates chiefly to nativities, journeys, and weddings; the third, on prognostics relative to various matters, is denominated *śákhá*. The direct and retrograde [478] motions of planets, with their rising and setting, and other particulars, he goes on to say, had been propounded by him in a treatise termed Karaṇa, meaning, as the scholiast remarks, his compilation entitled Pancha-siddhántiká: which constitutes the first and astronomical portion of his entire work. What relates to the first branch of astrology (*horá*), the author adds, had likewise been delivered by him, including nativities and prognostics concerning journeys and weddings. These astrological treatises of his author, the scholiast observes, are entitled Vṛihat-játaka, Vṛihad-yátrá, and Vṛihad-viváha-paṭala. The author proceeds to deliver the third part of his course, or the second on divination,

[1] Vṛihat-játaka, c. 26, § 5; where the author so describes himself. His scholiast also calls him A'vantika from his native city Ujjayaní, and terms him a Magadha Bráhman, and a compiler of astronomical science. Bhaṭṭotpala on *Vṛi.-ját.* 1. The same scholiast similarly describes him in the introduction of a commentary on a work of his son Pṛithuyaśas.

omitting, as he says, superfluous and pithless matter, which abounds in the writings of his predecessors: such as questions and replies in dialogue, legendary tales, and the mythological origin of the planets.

The third part is extant, and entire; and is generally known and cited by the title of Vṛihat-sanhitá, or great course of astrology: a denomination well deserved; for, notwithstanding the author's professions of conciseness, it contains about four thousand couplets distributed in more than a hundred chapters, or precisely (including the metrical table of contents) 106.[1]

Of the second part, the first section, on casting of nativities, called Vṛihat-játaka, is also extant, and comprises twenty-five chapters, or, with the metrical table of contents and peroration which concludes it, twenty-six.[2] The other two sections of this part of the course have not been recovered, though probably extant in the hands of Hindu astrologers.

The scholia of the celebrated commentator of this author's works, who is usually called Bhaṭṭotpala, and who in several places of his commentary names himself Utpala (quibbling with simulated modesty on his appellation, for [479] the word signifies stone),[3] are preserved; and are complete for the third part of the author's course, and for the first section of the second: and the remainder of it likewise is probably extant, as the copy of the first section in the possession of the author of this dissertation terminates abruptly after the commencement of the second.

This commentator is noticed in the list of authorities furnished by the astronomers of Ujjayaní, and is there stated

[1] [Edited and translated by Dr. Kern. Sanhitá is here used as equivalent to S'ákhá, or the third portion of Sanhitá in its wider sense.]

[2] [Printed with Utpala's Comm. at Benares and Bombay. Cf. Kern's Preface, p. 26.]

[3] Preface to the commentary on the Vṛihat-játaka. Conclusion of the gloss on ch. 18 of Vṛihat-sanhitá, etc. 'Stone (*utpala*) frames the raft of interpretation to cross the ocean composed by Varáhamihira.' [*Upala* is the Sanskrit for 'stone,' not *Utpala*. *Utpala* here simply means the author's name.]

as of the year 890 of the Śaka era (A.D. 968).[1] Sir William Jones supposed him to be the son of the author, whose work is expounded by him. The grounds of this notion, which is not, however, very positively advanced by that learned Orientalist,[2] are not set forth. No intimation of such relation of the scholiast to his author appears in the preface or the conclusion, nor in the colophon, of the commentary which has been inspected: nor in the body of the work, where the author is of course repeatedly named or referred to, without however any addition indicative of filial respect, as Hindu writers usually do employ when speaking of a parent or ancestor. Neither is there any hint of relationship in the commentary of the same scholiast Bhaṭṭotpala on a brief treatise of divination, entitled Praśna-koshṭhí, comprising fifty-six stanzas by Pṛithuyaśas, son of Varáhamihira. The suggestion of the filial relation of the scholiast is probably therefore a mere error.

The Pancha-siddhántiká of Varáhamihira has not yet been recovered; and is only at present known from [480] quotations of authors; and particularly a number of passages cited from it by his scholiast in course of interpreting his astrological writings. An important passage of it so quoted will be noticed forthwith.

It is a compilation, as its name implies, from five *siddhántas*, and they are specified in the second chapter of the Vṛihat-sanhitá, where the author is enumerating the requisite qualifications of an astronomer competent to calculate a calendar. Among other attainments, he requires him to be conversant with time measured by *yugas*, etc. as taught in the five *siddhántas* upon astronomy named Pauliśa, Romaka, Vásishṭha, Saura, and Paitámaha.[3]

[1] [He gives the date of his Comm. on Varáhamihira's *Vṛihat-játaka* as 888 S'aka (A.D. 966).]

[2] The words are, 'The comment written by Bhaṭṭotpala, who, it seems, was a son of the author.' As. Res., vol. ii. p. 390.

[3] Vṛihat-sanhitá, c. 2. § 7.

The title of Varáhamihira's compilation misled a writer on Hindu astronomy [1] into an unfounded supposition, that he was the acknowledged author of the five *siddhántas*; the names of two of which, moreover, are mistaken, Soma and Paulastya being erroneously substituted for Romaka and Pauliśa. These two, as well as the Vásishṭha, are the works of known authors, namely, Puliśa, Śrísheṇa, and Vishṇuchandra; all three mentioned by Brahmagupta: by whom also the whole five *siddhántas* are noticed under the very same names and in the same order; [2] and who has specified the authors of the first three.[3] The Vásishṭha of Vishṇuchandra was indeed preceded by an earlier work (so entitled) of an unknown author, from which that, as well as the Romaka, is in part taken; [4] and it may be deemed an amended edition: but the Romaka and Pauliśa are single of the names: and no Hindu astronomer, possessing any knowledge of the history of the science cultivated by him, ever [481] could imagine, that Varáhamihira composed the work which takes its name from Puliśa, the distinguished founder of a sect or school in astronomy opposed to that of Áryabhaṭṭa.

The passage of the Pancha-siddhántiká cited by the scholiast,[5] and promised to be here noticed, has been quoted in an essay inserted in the *Researches* of the Asiatic Society,[6] as well as a parallel passage of the Vṛihat-sanhitá,[7] both relative to the ancient and actual position of the colures; and deemed parallel (though one be less precise than the other), since they are cited together as of the same author, and consequently as of like import, by the scholiast.[8] The text of the Vṛihat-sanhitá is further authenticated by a quotation of it in the commentary of Pṛithúdaka on Brahmagupta; [9] and the former position of the colures is precisely that which

[1] As. Res., vol. viii. p. 196.
[2] Brahma-siddhánta, c. 14.
[3] *Ibid.* c. 11.
[4] *Ibid.*
[5] On Vṛihat-sanhitá, c. 2.
[6] See page 340 of the present volume.
[7] C. 3. § 1 and 2.
[8] On Vṛihat-sanh. c. 2.
[9] Brahm.-siddhánta, c. xi. § 54.

is described in the calendar appendant on the Vedas,[1] and which is implied in a passage of Paráśara concerning the seasons, which is quoted by Bhaṭṭotpala.

The position of the colures, affirmed as actual in his time by Varáhamihira, in the Vṛihat-sanhitá, implies an antiquity of either 1216 or 1440 years before A.D. 1800, according to the origin of the ecliptic determined from the star Chitrá (Spica virginis), distant either 180° or 183° from it; or a still greater antiquity, if it be taken to have corresponded more nearly with the Grecian celestial sphere. The mean of the two numbers (disregarding the surmise of greater antiquity), carries him to A.D. 472. If Varáhamihira concurred with those Indian astronomers, who allow an oscillation of the equinox to 27° in [482] 1800 years, or a complete oscillation of that extent both E. and W. in 7200 years, he must have lived soon after the year 3600 of the Kali *yuga*, or 421 Śaka, answering to A.D. 499; which is but six years from the date assigned to him by the astronomers of Ujjayaní, and twenty-seven from the mean before inferred.

It is probable, therefore, that he flourished about the close of the fifth century of the Christian era;[2] and this inference is corroborated by the mention of an astrologer of this name in the Panchatantra, the Sanskrit original of the fables of Pilpay, translated in the reign of Núshírván, King of Persia, in the latter part of the sixth century and beginning of the seventh.[3]

To that conclusion there is opposed an argument drawn from a passage of the Bháswatí-karaṇa; in which the author of that treatise, dated 1021 Śaka (A.D. 1098), professes to have derived instruction from Mihira, meaning, it is supposed,

[1] See Essays, vol. i. p. [108].

[2] [Dr. Bháu Dájí (J.R.A.S. 1864) has shown that Varáhamihira died in 509 S'aka, A.D. 587. The date in the Ujjayiní list, S'aka 427 (*sup.* p. 415), may refer to his birth.]

[3] Pref. to the Sanskrit edition of the Hitopadeśa, printed at Serampur. (See page 153 of the present volume.)

oral instruction from Varáhamihira; and the argument has been supported by computations which make the Súrya-siddhánta and Játakárṇava, the latter ascribed to Varáhamihira, to be both works of the same period, and as modern as the eleventh century.[1]

To this it has been replied, that the Mihira, from whom Satánanda, author of the Bháswatí, derived instruction, is not the same person or personage with the author of the Vṛihat-sanhitá; if indeed Satánanda's expression do intend the same name, Varáha.[2] That expression must be allowed to be a very imperfect designation, which omits half, and that the most distinctive half, of an appellation: and it is not such as would be applied [483] by a contemporary and auditor to an author and lecturer, whose celebrity could not yet be so generally diffused as to render a part of his name a sufficient intimation of the remainder, without previous and well-established association of the terms. But even conceding the interpretation, it would then be right to admit a third Varáhamihira, besides the two noticed by the chronologists of Ujjayaní; and the third will be an astronomer, contemporary with Rája Bhoja-deva, and the preceptor of Satánanda, and author of the Játakárṇava, supposing this treatise on nativities to be properly ascribed to an author bearing that name, and to be on sufficient grounds referred to the eleventh century.

There remains to be here noticed another treatise on casting of nativities, to which the same favourite name of a celebrated astrologer is affixed. It is a concise tract entitled Laghu-játaka: and its authenticity as a work of the astrologer of Ujjayaní is established by the verifying of a quotation of the scholiast Bhaṭṭotpala, who cites a passage of his author's compendious treatise on the same subject (*swalpa-játaka*), in course of expounding a rule of prognostication concerning the destination of a prince to the throne, and his future character as a monarch (Vṛihat-játaka, 11, 1). That passage occurs in

[1] As Res., vol. vi. p. 572. [2] See page 342 of the present volume.

the Laghu-játaka (Misc. Chap.). It is hardly to be supposed that the same writer can have given a third treatise on the same subject of nativities, entitled Játakárṇava.

The question concerning the age of the Súrya-siddhánta remains for consideration. It is a very material one, as both Varáhamihira and Brahmagupta speak of a Saura (or Solar) siddhánta, which is a title of the same import: and unless a work bearing this title may have existed earlier than the age which is assigned, for reasons to be at a future time examined, to the Súrya-siddhánta, [484] the conclusions respecting the periods when they respectively wrote are impeached in the degree in which those grounds of calculation may deserve confidence. Those grounds in detail will be discussed at a separate opportunity. But independently of this discussion of their merits, sufficient evidence does exist to establish that more than one edition of a treatise of astronomy has borne the name of Súrya (with its synonyma) the sun. For Lakshmídása cites one under the title of Vṛihat-súrya-siddhánta[1] (for a passage which the current solar Siddhánta does not exhibit), in contradistinction to another more frequently cited by him without the distinctive epithet of Vṛihat: and in these latter instances his quotations admit of verification. A reference of Bháskara to a passage of the Saura, or, as explained by his own annotation, the Súrya-siddhánta, does not agree with the text of the received Súrya-siddhánta.[2] His commentators indeed do not unreservedly conclude from the discrepancy a difference of the work quoted, and that usually received under the same title. Yet the inference seems legitimate. At all events the quotation from the Vṛihat-súrya-siddhánta, in the Gaṇita-tattwa-chintámaṇi of Lakshmídása, proves beyond question, that in that commentator's opinion, and consistently with his knowledge, more than one treatise bearing the same name existed.

[1] Gaṇ.-tattwa-chint. on Spherics of S'iromaṇi, ch. 4. Cons. of Sines.
[2] See page 330 of the present volume.

There is evidence besides of Arabian writers, that a system of astronomy bearing the equivalent title of A'rka (Solar) was one of three, which were found by them current among the Hindus, when the Arabs obtained a knowledge of the Indian astronomy in the time of the Abbasside Khalifs, about the close of the eighth century or commencement of the ninth of the Christian era.[1] A'rkand, [485] the name by which the Arabs designate one of those three astronomical systems, assigning it as an Indian term, is the well-known corruption of A'rka in the common dialects,[2] and is familiar in the application of the same word as a name of a plant (Asclepias gigantea), which bearing all the synonyma of the sun, is called vulgarly A'kand or A'rkand.

The *solar* doctrine of astronomy appears then to have been known by this name to the Arabians as one of the three Indian astronomical systems a thousand years ago. The fact is, that both the title and the system are considerably more ancient. Revisions of systems occasionally take place; like Brahmagupta's revisal of the Brahma-siddhánta, to adapt and modernize them; or, in other words, for the purpose, as Brahmagupta intimates, of reconciling computation and observation. The Súrya or A'rka-siddhánta, no doubt, has undergone this process, and actually exhibits manifest indications of it.[3]

In every view, it is presumed that any question concerning the present text of the Súrya-siddhánta, or determination of that question, will leave untouched the evidence for the age of the author of the Vṛihat-sanhitá, Varáhamihira, son of A'dityadása, an astrologer of Ujjayaní, who appears to have flourished at the close of the fifth or beginning of the sixth century of the Christian era. He was preceded, as it seems,

[1] See note N.

[2] [Albírúní explains A'rkand as the corruption of the Sanskrit *ahargaṇa*, 'number of the days.' This term was first used by Brahmagupta.—Reinaud's *Mémoire*, p. 322, cf. also p. 354.]

[3] As. Res., vol. ii. p. 235.

by another of the same name, who lived, according to the chronologists of Ujjayaní, at the close of the second century. He may have been followed by a third, who is said to have flourished at the court of Rájá Bhoja-deva of Dhárá, and to have had Satánanda, the author of the Bháswatí, for his scholar.

L.

Introduction and Progress of Algebra among the Italians.

[486] Leonardo of Pisa was unquestionably the first who made known the Arabian algebra to Christian Europe. The fact was, indeed, for a time disputed, and the pretensions of the Italians to the credit of being the first European nation which cultivated algebra, were contested, upon vague surmises of a possible, and therefore presumed probable, communication of the science of algebra, together with that of arithmetic, by the Saracens of Spain to their Christian neighbours in the Peninsula, and to others alleged to have resorted thither for instruction. The conjecture hazarded by Wallis (Algebra, Historical and Practical) on this point, was assisted by a strange blunder, in which Blancanus was followed by Vossius and a herd of subsequent writers, concerning the age of Leonardo, placed by them precisely two centuries too low. The claims of the Italians in his favour, and for themselves as his early disciples, were accordingly resisted with a degree of acrimony (Gua, Mém. de l'Acad. des Sc., 1741, p. 436), which can only be accounted for by that disposition to detraction, which occasionally manifests itself in the literary, as in the idler, walks of society. The evidence of his right to acknowledgments for transplanting Arabian algebra into Europe was for a long period ill set forth: but, when diligently

sought, and carefully adduced, doubt was removed and opposition silenced.[1]

The merit of vindicating his claim belongs chiefly to Cossali.[2] A manuscript of Leonardo's treatise on [487] arithmetic and algebra, bearing the title of *Liber Abbaci compositus a Leonardo filio Bonacci Pisano in anno* 1202, was found towards the middle of the last century by Targioni Tozzetti[3] in the Magliabecchian library at Florence, of which he had the care; and another work of that author, on square numbers, was afterwards found by the same person inserted in an anonymous compilation, treating of computation, (un trattato d'Abbaco), in the library of a royal hospital at the same place. A transcript of one more treatise of the same writer was noticed by Tozzetti in the Magliabecchian collection, entitled *Leonardi Pisani de filiis Bonacci Practica Geometriæ composita anno* 1220. The subject of it is confined to mensuration of land; and being mentioned by the author in his epistle prefixed to the revised Liber Abbaci, shows the revision to be of later date. It appears to be of 1228.[4] Tozzetti subsequently met with a second copy of the Liber Abbaci in Magliabecchi's collection: but it is described by him as inaccurate and incomplete.[5] A third has been since discovered in the Riccardian collection, also at Florence: and a fourth, but imperfect one, was communicated by Nelli to Cossali.[6] No diligence of research has, however, regained any trace of the volume which contained Leonardo's treatise on square numbers: the library in which it was seen having been dispersed previously to Cossali's inquiries.

It appears from a brief account of himself and his travels, and the motives of his undertaking, which Leonardo has

[1] Montucla, 2nd Ed. Additions.
[2] Origine, etc. dell'Algebra. Parma, 1797.
[3] Viaggi, vol. i. and vi. Edit. 1751—1754.
[4] Cossali, Origine, etc. c. 1. § 5.
[5] Viaggi, vol. ii. Edit. 1768.
[6] Origine, etc. dell'Algebra, c. 2. § 1.

introduced into his preface to the Liber Abbaci, that he [488] travelled into Egypt, Barbary, Syria, Greece, and Sicily; that being in his youth at Bugia in Barbary, where his father Bonacci held an employment of scribe at the Custom-house, by appointment from Pisa, for Pisan merchants resorting thither, he was there grounded in the Indian method of accounting by nine numerals: and that finding it more commodious, and far preferable to that which was used in other countries visited by him, he prosecuted the study,[1] and with some additions of his own and taking some things from Euclid's geometry, he undertook the composition of the treatise in question, that "the Latin race might no longer be found deficient in the complete knowledge of that method of computation." In the epistle prefixed to the revision of his work he professes to have taught the complete doctrine of numbers according to the Indian method.[2]

His peregrinations then, and his study of the Indian computation through the medium of Arabic, in an African city, took place towards the close of the twelfth century; the earliest date of his work being A.C. 1202.

He had been preceded by more than two centuries, in the study of arithmetic under Muhammadan instructors, by Gerbert (the Pope Silvester II.),[3] whose ardour for the acquisition of knowledge led him, at the termination of a two years' noviciate as a Benedictine, to proceed by stealth into Spain, where he learnt astrology from the Saracens, and with it more valuable science, especially [489] arithmetic. This, upon his return, he communicated to Christian Europe, teaching the method of numbers under the designation of Abacus, a name apparently first introduced by him (rationes numerorum

[1] Quare amplectens strictius ipsum modum Yndorum, et actentius studens in eo, ex proprio sensu quædam addens, et quædam ex subtilitatibus Euclidis geometriæ artis apponens, etc.

[2] Plenam numerorum doctrinam edidi Yndorum, quem modum in ipsa scientia præstantiorem elegi.

[3] Archbishop in 992; Pope in 999; died in 1003.

Abaci[1]), by rules abstruse and difficult to be understood, as William of Malmesbury affirms: *Abacum certe primus a Saracenis rapiens, regulas dedit, quæ a sudantibus Abacistis vix intelliguntur.*[2] It was probably owing to this obscurity of his rules and manner of treating the Arabian, or rather Indian arithmetic, that it made so little progress between his time and that of the Pisan.

Leonardo's work is a treatise of arithmetic, terminated, as Arabic treatises of computation are similarly,[3] by the solution of equations of the two first degrees. In the enumeration and exposition of the parts comprised in his fifteenth chapter, which is his last, he says, *Tertia erit super modum Algebræ et Almucabalæ;* and, beginning to treat of it, *Incipit pars tertia de solutione quarundam quæstionum secundum modum Algebræ et Almucabalæ, scilicet oppositionis et restaurationis.* The sense of the Arabic terms is here given in the inverse order, as has been remarked by Cossali, and as clearly appears from Leonardo's process of resolving an equation, which will be hereafter shown.

He premises the observation, that in number three considerations are distinguished; one simple and absolute, which is that of number in itself; the other two relative, being those of root and of square. The latter, as he adds, [490] is called *census*, which is the term he afterwards employs throughout.

It is the equivalent of the Arabic *mál*, which properly signifies wealth, estate; and *census* seems therefore to be here employed by Leonardo, on account of its correspondent acceptation (*quicquid fortunarum quis habet.* Steph.); in like manner as he translates the Arabic *shai* by *res*, thing, as a designation of the root unknown.

He accordingly proceeds to observe that the simple number, the root, and the square (*census*), are equalled together in six

[1] Ep. prefixed to his Treatise De Numerorum Divisione. Gerb. Ep. 160. (Ed. 1611.) [2] De Gestis Anglorum, c. 2.

[3] See Mr. Strachey's examination of the Khulásatu'l hisáb, As. Res. vol. xii. Early History of Algebra.

ways: so that six forms of equality are distinguished; the three first of which are called simple, and the three others compound. The order in which he arranges them is precisely that which is copied by Paciolo.[1] It differs by a slight transposition from the order in which they occur in the earliest Arabic treatises of algebra;[2] and which, no doubt, was retained in the Italian version from the Arabic executed by Guglielmo di Lunis, and others who are noticed by Cossali upon indications which are pointed out by him.[3] For Paciolo cautions the reader not to regard the difference of arrangement, as this is a matter of arbitrary choice.[4] Leonardo's six-fold distinction, reduced to the modern algebraic notation, is 1st, $x^2 = p\ x$. 2nd, $x^2 = n$. 3rd, $p\ x = n$. 4th, $x^2 + p\ x = n$. 5th, $p\ x + n = x^2$. 6th, $x^2 + n = p\ x$. In Paciolo's abridged notation it is 1st, c^o *e* c^a. 2nd, c^o *e* n^o. 3rd, c^a *e* n^o, etc.[5] The Arabic arrangement, in the treatise of the Khuwarazmite, is, 1st, $x^2 = p\ x$. 2nd, $x^2 = n$. 3rd, $p\ x = n$. 4th, $x^2 + p\ x = n$. 5th, $x^2 + n = p\ x$. 6th, $p\ x + n = x^2$. Later compilations transfer the third of these to the first place.[6]

[491] Like the Arabs, Leonardo omits and passes unnoticed the fourth form of quadratic equations, $x^2 + p\ x + n = o$. It could not, indeed, come within the Arabian division of equations into simple, between species and species, and compound, between one species and two:[7] quantity being either stated affirmatively, or *restored* in this algebra to the positive form. Paciolo expressly observes that in no other but these six ways is any equation between those quantities possible: *Altramente che in questi* 6 *discorsi modi non e possibile alcuna loro equatione.*

Leonardo's resolution of the three simple cases of equation is not exhibited by Cossali. It is, however, the same, no doubt, with that which is taught by Paciolo; and which precisely agrees with the rules contained in the Arabic

[1] Summa de Arithmetica, etc.
[2] See note N.
[3] Origine, etc., dell' Alg.
[4] Summa, 8, 5, 5.
[5] Summa, 8, 5, 5.
[6] *Khulásatu'l hisáb.*
[7] *Khulásatu'l hisáb.*

books.[1] To facilitate comparison, and obviate distant reference, Paciolo's rules are here subjoined in fewer words than he employs.

1st. Divide the things by the squares [coefficient by coefficient], the quotient is the value of thing.

2nd. Divide the number by the squares [by the coefficient of the square], the root of the quotient is the value of thing.

3rd. Divide the number by the things [that is, by the coefficient], the quotient is the value of thing.[2]

The resolution of the three cases of compound equations is delivered by Cossali from Leonardo, contracting his rugged Latin into modern algebraic form.

1st. Be $x^2+px=n$. Then $x=-\frac{1}{2}p+\sqrt{(\frac{1}{4}p^2+n)}$.

2nd. Be $x^2=px+n$. Then $x=\frac{1}{2}p+\sqrt{(\frac{1}{4}p^2+n)}$.

3rd. Be $x^2+n=px$. Then, if $\frac{1}{4}p^2 \angle n$, the equation is
[492] impossible. If $\frac{1}{4}p^2=n$, then $x=\frac{1}{2}p$. If $\frac{1}{4}p^2 \; 7 \; n$, then $x=\frac{1}{2}p-\sqrt{(\frac{1}{4}p^2-n)}$, or $=\frac{1}{2}p+\sqrt{(\frac{1}{4}p^2-n)}$.

He adds the remark: *Et sic, si non solvetur quæstio cum diminutione, solvetur cum additione.*

The rules are the same which are found in the Arabic treatises of algebra.[3] The same rules will be likewise found in the work of Paciolo, expressed with his usual verboseness in his Italian text: to which, in this instance, he has added in the margin the same instructions delivered in a conciser form in Latin memorial verses. As they are given at length by Montucla, it is unnecessary to cite them in this place. On the subject of the impossible case Paciolo adds, as a *Notandum utilissimum*, '*Sel numero qual si trova in la ditta equatione accompagnato con lo censo, sel non e minore o veramente equale al quadrato de la mita de le cose, el caso essere insolubile: e per consequente dico aguaglimento non potere avenire per alcun modo.*' Summa, 8, 4, 12.

Concerning the two roots of the quadratic equation in the other case, under the same head, he thus expands the short

[1] See note N; and As. Res., vol. xii. [2] Summa, 8, 5, 6. [3] See note N.

concluding remark of Leonardo: *Sicche l'uno e l'altro modo satisfa al tema: ma a le volte se have la verita a l'uno modo, a le volte a l'altro;*[1] *el perche, se cavando la radice del ditto remanente de la mita de le cose non satisfacesse al tema, la ditta radice aggiongni a la mita de le cose, e averai el quesito: e mai fallara che a l'uno di tai modi non sia satisfatto al quesito, cioe giongnendo la, overo cavando la del dimeciamento de le cose.* Summa, 8, 4, 12.

Bombelli remarks somewhat differently on the same point. *Nei quesiti alcuna volta, ben che di rado, il restante non servi, ma ben si la somma sempre.* Alg. 2, 262.

[493] The rules for the resolution of compound equations are demonstrated by Leonardo upon rectilinear figures; and in the last instance he has reference to Euclid.—Lib. 2. Th. 5. There is room then to surmise, that some of the demonstrations are among the additions which he professes to have made.

Among the many problems which he proceeds to resolve, two of which are selected by Cossali for instances of his manner, it will be sufficient to cite one, in the resolution of which the whole thread of his operations is exhibited; substituting, however, the more compendious modern signs. His manner of conducting the algebraic process may be fully understood from this single instance.

Problem: To divide the number 10 into two parts, such that dividing one by the other, and adding 10 to the sum of the quotient, and multiplying the aggregate by the greater, the amount is finally 114.

Let the right line a be the greater of the parts sought; which I call *thing* (*quam pono rem*): and the right line $b\ g$ equal to 10: to which are joined in the same direction $g\ d$, $d\ e$, representing the quotients of division of the parts, one by the other. Since a multiplied by $b\ e$ is equal to 114, therefore $a \times b\ g + a \times g\ d + a \times d\ e = 114$; and taking from each side $a \times b\ g$, there will be $a \times g\ d + a \times d\ e = 114 - a \times b\ g$. Be $g\ d$

[1] Compare with Hindu algebra. Vij.-gan., § 130 and 142.

the quotient $\frac{10-a}{a}$, there will arise $10-a+a\times d\ e=114-a\times b\ g=114-10\ a$; since $b\ g$ is equal to 10. Whence $a\times d\ e=104-9\ a$. But $d\ e$ is the quotient $\frac{a}{10-a}$: wherefore $\frac{a^2}{10-a}=104-9\ a$. So that $a^2=1040-194\ a+9\ a^2$. Restore diminished things (*restaura res diminutas*), and take one square from each side (*et extrahe unum censum ab utraque parte*), the remainder [494] is $8\ a^2+1040=194\ a$; and dividing by eight, $a^2+130=24\frac{1}{4}\ a$; and resolving this according to rule, $a=\frac{97}{8}-\sqrt{\left(\frac{97}{8}\right)^2-130}=\frac{97}{8}-\frac{33}{8}=8$: consequently $10-a=2$.

Besides his great work on arithmetic and algebra, Leonardo was author of a separate treatise, as already intimated, on square numbers. Reference is formally made to it by Paciolo, who drew largely from this source, and who mentions *Le quali domande* (questions concerning square numbers) *sone difficillissime quanto ala demonstratione dela practica: comme sa chi ben l' a scrutinato. Maxime* Leonardo Pisano *in un particulare tractato che fa* de quadratis numeris *intitulato. Dove con grande sforzo se ingegna dare norma e regola a simili solutioni.* Summa 1, 4, 6.

The directions for the solution of such problems being professedly taken by Paciolo chiefly from Leonardo, and the problems themselves which are instanced by him being probably so, it can be no difficult task to restore the lost work of Leonardo on this subject. The divination has accordingly been attempted by Cossali, and with a considerable degree of success. (Origine, etc. dell'Algebra, c. 5.)

Among problems of this sort which are treated by Paciolo after Leonardo, several are found in the current Arabic treatises; others, which belong to the indeterminate analysis,

occur in the algebraic treatises of the Hindus; some, which are more properly Diophantine, may have been taken from the Arabic translation, or commentary, of the work of Diophantus. Leonardo's endeavour to reduce the solution of such problems to general rule and system, according to Paciolo's intimation of his efforts towards that end, must have been purely his own: as nothing systematic to this effect is to be found in the [495] Arabic treatises of algebra; and as he clearly had no communication through his Arab instructors, nor any knowledge of the Hindu methods for the general resolution of indeterminate problems, simple or quadratic.

Montucla, who had originally underrated the performance of Leonardo, seems to have finally conceded to it a merit rather beyond its desert, when he ascribes to that author the resolution of certain biquadratics as derivative equations of the second degree. The derivative rules were, according to Cardan's affirmation, added to the original ones of Leonardo by an uncertain author; and placed with the principal by Paciolo. Cardan's testimony in this respect is indeed not conclusive, as the passage in which the subject is mentioned is in other points replete with errors; attributing the invention of algebra to Muhammad son of Músa, and alleging the testimony of Leonardo to that point; limiting Leonardo's rules to four, and intimating that Paciolo introduced the derivative rules in the same place with the principal: all which is unfounded and contrary to the fact. Cossali, however, who seems to have diligently examined Leonardo's remains, does not claim this honour for his author; but appears to admit Cardan's position, that the derivative, or, as they are termed by Paciolo, the proportional equations, and rules for the solution of them, were devised by an uncertain author, and introduced by Paciolo into his compilation under a separate head: which actually is the case. (Summa, 8, 6, 2, etc.)

In regard to the blunder, in which Montucla copied earlier writers, respecting the time when Leonardo of Pisa flourished,

he has defended himself (2nd edit. Additions) against the reprehension of Cossali, upon the plea, that he was not bound to know of manuscripts existing in certain libraries of Italy, which served to show the age in [496] which that author lived. The excuse is not altogether valid: for Targioni Tozzetti had announced to the public the discovery of the manuscripts in question, with the date, and a sufficient intimation of the contents, several years before the first volumes of Montucla's History of Mathematics appeared.[1]

I am withheld from further animadversion on the negligence of an author who has in other respects deserved well of science, by the consideration, that equal want of research, and in the very same instance, has been manifested by more recent writers, and among our own countrymen. Even so lately as in the past year (1816) a distinguished mathematician, writing in the Encyclopædia which bears the national appellation,[2] has relied on obsolete authorities and antiquated disquisitions concerning the introduction of the denary numerals into Europe, and shown total unacquaintance with what was made public sixty years ago by Targioni Tozzetti, and amply discussed by Cossali in a copious work on the progress of algebra in Italy, and in an earlier one on the origin of arithmetic, published more than twenty years since: matter fully recognized by Montucla in his second edition, and briefly noticed in common biographical dictionaries.[3]

In the article of the Encyclopædia to which reference has been just made, the author is not less unfortunate in all that he says concerning the Hindus and their arithmetical knowledge. He describes the Lílávatí as "a short and [497] meagre performance headed with a silly preamble and colloquy of the gods." (Where he got this colloquy is difficult to divine;

[1] Targioni Tozzetti's first volume bears date 1751. His sixth (the last of his first edition) 1754. Montucla's first two volumes were published in 1758.

[2] Encycl. Brit. Supp. art. Arithmetic.

[3] Dict. Hist. par Chaudon et Dalandine: art. Leonard de Pise. 7 Edit, (1789). Probably in earlier editions likewise.

the Lílávatí contains none.) "The examples," he says, "are generally very easy, and only written on the margin with red ink." (Not so written in any one among the many copies collated or inspected.) "Of fractions," he adds, "whether decimal or vulgar, it treats not at all." (See ch. 2, sect. 3, and ch. 4, sect. 2, also § 138.)

He goes on to say, "The Hindus pretend, that this arithmetical treatise was composed about the year 1185 of the Christian era, etc." Everything in that passage is erroneous. The date of the Lílávatí is 1150, at the latest. The uncertainty of the age of a manuscript does not, as suggested, affect the certainty of the date of the original composition. It is not true, as alleged, that the Oriental transcriber is accustomed to incorporate without scruple such additions in the text as he thinks fit. Nor is it practicable for him to do so with a text arranged in metre, of which the lines are numbered: as is the case with Sanskrit text-books in general. Collation demonstrates that no such liberty has been taken with the particular book in question.

The same writer affirms, that "the Persians, though no longer sovereigns of Hindustan, yet display their superiority over the feeble Gentoos, since they generally fill the offices of the revenue, and have the reputation of being the most expert calculators in the East." This is literally and precisely the reverse of the truth; as every one knows, who has read or heard anything concerning India.

The author is not more correct when he asserts, that "it appears from a careful inspection of the manuscripts preserved in the different public libraries in Europe, that the Arabians were not acquainted with the denary numerals [498] before the middle of the thirteenth century of the Christian era." Leonardo of Pisa had learned the Indian numerals from Arabian instruction in the twelfth century, and taught the use of them in the second year of the thirteenth: and the Arabs were in possession of the Indian mode of computation

by these numerals so far back as the eighth century of the Christian era.[1]

To return to the subject.

After Leonardo of Pisa, and before the invention of the art of printing, and publication of the first printed treatise on the science, by Paciolo, algebra was diligently cultivated by the Italian mathematicians ; it was publicly taught by professors ; treatises were written on it, and recurrence was again had to the Arabian source. A translation of "the Rule of Algebra" (La Regola dell' Algebra) from the Arabic into the language of Italy, by Guglielmo di Lunis, is noticed at the beginning of the Ragionamento di Algebra by Raffaelo Caracci, the extant manuscript of which is considered by antiquarians to be of the fourteenth century.[2] A translation of the original treatise of Muhammad ben Músa, the Khuwárazmite, appears to have been current in Italy : and was seen at a later period by both Cardan and Bombelli.[3] Paolo della Pergola, Demetrio Bragadini, and Antonio Cornaro, are named by Paciolo as successively filling the professor's chair at Venice ; the latter his own fellow-disciple. He himself taught algebra publicly at Peroscia at two different periods. In the preceding age a number of treatises on algorithm, some of them with that title: others, like Leonardo's, entitled De Abaco, and [499] probably like his touching on algebra as well as arithmetic, were circulated. Paolo di Dagomari, in particular, a mathematician living in the middle of the fourteenth century, obtained the surname of Dell' Abaco for his skill in the science of numbers, and is besides said to have been conversant with equations (whether algebraic or astronomical may indeed be questioned), as well as geometry.[4]

With the art of printing came the publication of Paciolo, and the subsequent history of the inventions in algebra by Italian masters, is too well known to need to be repeated in this place.

[1] See note N. [2] Cossali, Orig. etc. dell' Algebra, vol. i. p. 7.
[3] *Ibid.* vol. i. p. 9. Cardan, Ars Magna, 5. [4] Cossali, vol. i. p. 9.

M.

Arithmetics of Diophantus.

Five copies of Diophantus, *viz.* three in the Vatican (Cossali, *Orig. dell' Alg.* i. 4, § 2.); Xylander's, supposed (Coss. *ib.* § 5.) to be the same with the Palatine inspected by Saumaise, though spoken of as distinct by Bachet (*Epist. ad lect.*); and the Parisian used by Bachet himself (*ib.*); all contain the same text. But one of the Vatican copies, believed to be that which Bombelli consulted, distributes a like portion of text into seven instead of six books. (Coss. *ib.* § 5.) In truth the division of manuscript books is very uncertain: and it is by no means improbable, that the remains of Diophantus, as we possess them, may be less incomplete, and constitute a larger portion of the thirteen books announced by him (*Def.* 11), than is commonly reckoned. His treatise on polygon numbers, which is surmised to be one (and that the last) of the thirteen, follows, as it seems, the six (or [500] seven) books in the exemplars of the work, as if the preceding portion were complete. It is itself imperfect: but the manner is essentially different from that of the foregoing books: and the solution of problems by equations is no longer the object, but rather the demonstration of propositions. There appears no ground, beyond bare surmise, to presume, that the author, in the rest of the tracts relative to numbers, which fulfilled his promise of thirteen books, resumed the algebraic manner: or, in short, that the algebraic part of his performance is at all mutilated in the copies extant, which are considered to be all transcripts of a single imperfect exemplar. (Bachet, *Ep. ad lect.*)

It is indeed alleged, that the resolution of compound equations (two species left equal to one) which Diophantus promises (*Def.* 11) to show subsequently, bears reference to a lost part of his work. But the author, after confining him

self to cases of simple equations (one species equal to one species) in the first three books, passes occasionally to compound equations (two species equal to one, and even two equal to two species) in the three following books. See iv. Q. 33; vi. Q. 6 and 19; and Bachet on *Def.* 11, and i. Q. 33. In various instances he pursues the solution of the problem, until he arrives at a final quadratic equation; and, as in the case of a simple equation, he then merely states the value inferrible, without specifying the steps by which he arrives at the inference. See iv. Q. 23; vi. Q. 7, 9 and 11. But, in other places, the steps are sufficiently indicated: particularly iv. Q. 33 and 45; v. Q. 13; vi. Q. 24: and his method of resolving the equation is the same with the second of Brahmagupta's rules for the resolution of quadratics (Brahm. 18, § 34). The first of the Hindu author's rules, the same with Śrídhara's quoted by Bháskara (*Víj.-gaṇ.* § 131; Brahm. 18, § 32), differs from that of Nugnez (Nonius) quoted by [501] Bachet (on Dioph. i. 33), in dispensing with the preliminary step of reducing the square term to a single square: a preparation which the Arabs first introduced, as well as the distinction of three cases of quadratics: for it was practised neither by Diophantus, nor by the Hindu algebraists.

Diophantus has not been more explicit, nor methodical, on simple, than on compound, equations. But there is no reason to conclude, that he returned to either subject in a latter part of his work, for the purpose of completing the instruction, or better explaining the method of conducting the resolution of those equations. Such does not seem to be the manner of his arithmetics, in which general methods and comprehensive rules are wanting. It is rather to be inferred, as Cossali does, from the compendious way in which the principles of Algebra are delivered, or alluded to, by him, that the determinate analysis was previously not unknown to the Greeks, wheresoever they got it; and that Diophantus, treating of it cursorily as a matter already understood, gives all his attention to cases of

indeterminate analysis, in which perhaps he had no Greek precursor. (Coss. *Orig. dell' Alg.* i. 4, § 10.) He certainly intimates, that some part of what he proposes to teach is new: *ἴσως μὲν οὖν δοκεῖ τὸ πρᾶγμα δυσχερέστερον ἐπειδὴ μήπω γνώριμόν ἐστι.* While in other places (*Def.* 10) he expects the student to be previously exercised in the algorithm of algebra. The seeming contradiction is reconciled by conceiving the principles to have been known; but the application of them to a certain class of problems concerning numbers to have been new.

Concerning the probable antiquity of the Diophantine algebra, all that can be confidently affirmed is, that it is not of later date than the fourth century of Christ. Among the works of Hypatia, who was murdered [502] A.D. 415, as they are enumerated by Suidas, is a commentary on a work of a Diophantus, most likely this author. An epigram in the Greek anthologia (lib. ii. c. 22[1]) is considered with probability to relate to him: but the age of its author Lucillius is uncertain. Bachet observes, that, so far as can be conjectured, Lucillius lived about the time of Nero. This, however, is mere conjecture.[2]

Diophantus is posterior to Hypsicles, whom he cites in the treatise on polygon numbers. (Prop. 8.) This should furnish another fixed point. But the date of Hypsicles is not well determined. He is reckoned the author, or at least the reviser,[3] of two books subjoined to Euclid's elements, and numbered 14th and 15th. In the introduction, he makes mention of Apollonius, one of whose writings, which touched on the ratio of the dodecaedron and icosaedron inscribed in the same sphere, was considered by Basilides of Tyre, and by the father of him (Hypsicles), as incorrect, and was amended by them accordingly: but subsequently he (Hypsicles) met with another work of Apollonius, in which the investigation

[1] [xi. 103.]

[2] [But. cf. ix. 572.]

[3] *Tárikhu'l hukamá*, cited by Casiri, *Bibl. Arab. Hisp.*, vol. i. p. 346. The Arabian author uses the word *aslah*, 'amended.'

of the problem was satisfactory, and the demonstration of the proposition correct. Here again Bachet observes, that, so far as can be conjectured, from the manner in which he speaks of Apollonius, he must have lived not long after him. Cossali goes a little further: and concludes, on the same grounds, that they were nearly contemporary. (*Orig. dell' Alg.* i. 4, § 4.) The grounds seem inadequate to support any such conclusion: and all that can be certainly inferred is, that Hypsicles of Alexandria was posterior to Apollonius, who flourished in the reign of Ptolemy Euergetes: two hundred years before Christ.

[503] Several persons of the name of Diophantus are noticed by Greek authors; but none whose place of abode, profession, or avocations, seem to indicate any correspondence with those of the mathematician and algebraist: one, a prætor of Athens, mentioned by Diodorus Siculus, Zenobius, and Suidas; another, secretary of King Herod, put to death for forgery, as noticed by Tzetzes; and a third, the instructor of Libanius in eloquence, named by Suidas in the article concerning that sophist and rhetorician.

The Armenian Abú'lfaraj places the algebraist Diophantus under the Emperor Julian. But it may be questioned, whether he has any authority for that date, besides the mention by Greek authors of a learned person of the name, the instructor of Libanius, who was contemporary with that Emperor.

Upon the whole, however, it seems preferable to abide by the date furnished in a professed history, even an Arabic one, on a Grecian matter; and to consider Diophantus as contemporary with the emperor Julian, about A.D. 365. That date is consistent with the circumstance of Hypatia writing a commentary on his works; and is not contradicted by any other fact, nor by the affirmation of any other writer besides Bombelli, on whose authority Cossali nevertheless relies.

Bombelli, when he announced to the public the existence of a manuscript of Diophantus in the Vatican, placed the author under the emperor Antoninus Pius, without citing any

grounds. His general accuracy is, however, impeached by his assertion, that the Indian authors are frequently cited by Diophantus. No such quotations are found in the very manuscript of that author's work, which he is known to have consulted, and which has been purposely re-examined. (Coss. i. 4, § 4.) Bom[504]belli's authority was, therefore, very properly rejected by Bachet, and should have been so by Cossali.

N.

Progress and Proficiency of the Arabians in Algebra.[1]

In the reign of the second Abbasside Khalif Almansúr, and in the 156th year of the Hijra (A.D. 773), as is related in the preface to the astronomical tables of Ben al Adamí, published by his continuator Al Kásim in 308 H. (A.D. 920), an Indian astronomer, well versed in the science which he professed, visited the Court of the Khalif, bringing with him tables of the equations of planets according to the mean motions, with observations relative to both solar and lunar eclipses and the ascension of the signs; taken, as he affirmed, from tables computed by an Indian prince, whose name, as the Arabian author writes it, was Phíghar. The Khalif, embracing the opportunity thus happily presented to him, commanded the book to be translated into Arabic, and to be published for a guide to the Arabians in matters pertaining to the stars. The task devolved on Muhammad ben Ibráhím Alfazárí; whose version is known to astronomers by the name of the greater *Sind-hind*, or *Hind-sind*, for the term occurs written both ways.[2] It signifies, according to the same author Ben al

[1] [Cf. also Woepcke's *Recherches sur l'histoire des Sciences Mathématiques chez les Orientaux*, *Journ. Asiatique*, 1854-5, and his edition of Omar al Khayyámí, 1851, and *Extrait du Fakhri*, 1853.]

[2] Casiri, *Bibl. Arab. Hisp.* citing *Bibl. Arab. Phil.* (Táríkhu'l hukamá), vol. i. p. 428, *voce* Alphazárí.

Adamí, the revolving ages, *Ad dahr ad dáhir;* which Casiri translates *perpetuum æternumque.*[1]

No Sanskrit term of similar sound occurs, bearing a signification reconcilable to the Arabic interpretation. If a [505] conjecture is to be hazarded, the original word may have been Siddhánta.[2] Other guesses might be proposed, partly combining sound with interpretation, and taking for a termination *sindhu* 'ocean,' which occurs in titles now familiar for works relative to the regulation of time, as Kála-sindhu, Samaya-sindhu, etc., or adhering exclusively to sound, as Indu-sindhu, or Indu-siddhánta; the last a title of the same import with Soma-siddhánta still current. But whatever may have been the name, the system of astronomy which was made known to the Arabs, and which is by them distinguished by the appellation in question, appears to have been that which is contained in the Brahma-siddhánta, and which is taught in Brahmagupta's revision of it. This fact is deducible from the number of elapsed days between the beginning of planetary motions and the commencement of the present age of the world, according to the Indian reckoning, as it is quoted by the astrologer of Balkh, Abú Ma'shar, and which precisely agrees with Brahmagupta. The astrologer does not indeed specify which of the Indian systems he is citing. But it is distinctly affirmed by later Arabian authorities, that only one of the three Indian doctrines of astronomy was understood by the Arabs; and that they had no knowledge of the other two beyond their names.[3] Besides, Áryabhaṭṭa and the Árka-siddhánta, the two in question, would have furnished very different numbers.

[1] *Ibid*, vol. i. p. 426, *voce* Katka. Sind and Hind likewise signify, in the Arabian writers, the hither and remoter India. D'Herbelot, *Bibl. Orient.* p. 415.

[2] [Reinaud (*Mém.* p. 331) quotes from Albírúní, "Our word Sind-hind answers to what the Hindus call *Sidhánd.* This word properly means 'what is straight and does not bend, what cannot be altered.'" This definition exactly agrees with *siddhánta*, 'demonstrated conclusion,' 'certain truth.']

[3] *Tárikhu'l hukamá*, cited by Casiri, *Bibl. Arab. Hisp.*, vol. i. p. 426, *voce* Katka.

The passage of Abú Ma'shar, to which reference has been now made, is remarkable, and even important; and, as it has been singularly misunderstood and grossly misquoted by Bailly, in his Astronomie Ancienne (p. 302), it may be necéssary to cite it at full length in this place. [506] It occurs at the end of the fourth tract (and not, as Bailly quotes, the beginning of the fifth), in Abú Ma'shar's work on the conjunctions of planets. The author there observes, that 'the Indians reckoned the beginning [of the world] on Sunday, at sunrise (or, to quote from the Latin version, Et æstimaverunt Indi quod principium fuit die dominica sole ascendente); and between that day and the day of the deluge (et est inter eos, s. inter illum diem et diem diluvii) 720,634,442,715 days equivalent to 1,900,340,938[1] Persian years and 344 days. The deluge happened on Friday (et fuit diluvium die Veneris) 27th day of Rabe 1st, which is 29 from Cibat and 14 from Adristinich. Between the deluge and the first day of the year in which the Hijra occurred (fuerunt ergo inter diluvium et primum diem anni in quo fuit Alhegira) 3837 years and 268 days; which will be, according to the years of the Persians, 3725 years and 348 days. And between the deluge and the day of Jesdagir (Yazdajird) king of the Persians, from the beginning of whose reign the Persians took their era, ... 3735 years, 10 months, and 22 days.' The author proceeds with the comparison of the eras of the Persians and Arabians, and those of Alexander and Philip; and then concludes the treatise: completi sunt quatuor tractatus, Deo adjuvante.

Bailly's reference to this passage is in the following words. 'Albumasar[2] rapporte que selon les Indiens, il s'est écoulé 720,634,442,715 jours entre le déluge et l'époque de l'hégire.

[1] There is something wanting in the number of years: which is deficient at the third place. Both editions of the translation (Augsburg 1489, Venice 1515) give the same words.

[2] De Magn. Conj. Traité v, au commencement.

Il en conclut, on ne sait trop comment, qu'il s'est écoulé 3725 ans dans cet intervalle: ce qui placeroit [507] le déluge 3103 ans avant J. C. précisément à l'époque chronologique et astronomique des Indiens. Mais Albumasar ne dit point comment il est parvenu à égaler ces deux nombres de 3725 ans et de 720,634,442,715 jours.'—*Ast. anc. ecl.* liv. i. § xvii.

Now on this it is to be observed, that Bailly makes the ante-diluvian period between the Sunday on which the world began and the Friday on which the deluge took place, comprising 720,634,442,715 days, to be the same with the post-diluvian period, from the deluge to the Hijra; and that he quotes the author, as unaccountably rendering that number equivalent to 3725 years, though the text expressly states more than 1,900,000,000 years. The blunder is the more inexcusable, as Bailly himself remarked the inconsistency, and should therefore have re-examined the text which he cited, to verify his quotation.

Major Wilford,[1] relying on the correctness of Bailly's quotation, concluded that the error originated with either the transcriber or translator. But in fact the mistake rested solely with the citer: as he would have found if his attention had been drawn to the more correct quotation in Anquetil du Perron's letter prefixed to his *Recherches Hist. et Géog. sur l'Inde*, inserted in Bernoulli's second volume of *Desc. de l'Inde* (p. xx). But, though Anquetil is more accurate than Bailly in quotation, he is not more successful in his inferences, guesses, and surmises. For he strangely concludes from a passage which distinctly proves the use of the great cycle of the *kalpa* by the Indian astronomers to whom Abú Ma'shar refers, that they were on the contrary unacquainted in those days with a less cycle, which is comprehended in it. So little did he understand the Indian periods, that he infers from a specified [508] number of elapsed days and correspondent

[1] As. Res., vol. x. p. 117.

years, reckoned from the beginning of the great cycle which dates from the supposed moment of the commencement of the world, that they knew nothing of a subordinate period, which is one of the elements of that cycle. Nor is he nearer the truth, but errs as much the other way, in his conjecture, that the number of solar years stated by Abú Ma'shar relates to the duration of a life of Brahmá, comprising a hundred of that deity's years.

In short, Anquetil's conclusions are as erroneous as Bailly's premises. The discernment of Mr. Davis, to whom the passage was indicated by Major Wilford, anticipated the correction of this blunder of Bailly, by restoring the text with a conjectural emendation worthy of his sagacity.[1]

The name of the Indian author from whom Abú Ma'shar derived the particulars which he has furnished, is written by Bailly, Kankaraf; taken, as he says, from an ancient Arabic writer, whose work is subjoined to that of Messala, published at Nuremberg by Joachim Heller in 1648.[2] The Latin translation of Messahala (Má-shá'-Allah) was edited by Joachim Heller at Nuremberg in 1549: but it is not followed, in the only copy accessible to me, by the work of any other Arabic author; and the quotation consequently has not been verified. D'Herbelot writes the name variously; Kankah or Cancah, Kenker or Kankar, and Kengheh or Kanghah;[3] to which Reiske and Schultens, from further research, add another varia[509]tion, Kengch;[4] which is not of Arabic but Persian orthography. Casiri, by a difference of the diacritical point, reads from the Táríkhu'l hukamá, and transcribes, Katka.[5] That the same individual is all along meant, clearly appears

[1] As. Res., vol. ix. p. 242. Appendix to an Essay of Major Wilford.

[2] Astr. Anc. p. 303.

[3] *Bibl. Or.* Art. Cancah al Hendi, and Kenker al Hendi. Also Ketab Menazel al Camar and Ketab al Keranat.

[4] *Bibl. Or.* (1777-79), vol. iv. p. 726. Should be Kengeh: a like error occurs p. 727, where *sharch* is put for *shareh.*

[5] *Bibl. Arab. Hisp.*, vol. i. p. 426.

from the correspondence of the works ascribed to him; especially his treatise on the greater and less conjunctions of the planets, which was imitated by Abú Ma'shar.

Amidst so much diversity in the orthography of the word it is difficult to retrieve the original name, without too much indulgence in conjecture. Kanka, which comes nearest to the Arabic corruption, is in Sanskrit a proper name among other significations; but it does not occur as the appellation of any noted astrologer among the Hindus. Garga does; and, as the Arabs have not the soft guttural consonant, they must widely corrupt that sound; yet Kanghar and Kankah seem too remote from it to allow it to be proposed as a conjectural restoration of the Indian name.

To return to the more immediate subject of this note. The work of Alfazárí, taken from the Hindu astronomy, continued to be in general use among the Muhammadans, until the time of Almámún; for whom it was epitomized by Muhammad ben Músa al Khuwárazmí; and his abridgment was thenceforward known by the title of the less *Sind-hind.* It appears to have been executed for the satisfaction of Almámún before this prince's accession to the Khiláfat, which took place early in the third century of the Hijra and ninth of Christ. The same author compiled similar astronomical tables of his own; wherein he professed to amend the Indian tables which furnished the [510] mean motions; and he is said to have taken for that purpose equations from the Persian astronomy, some other matters from Ptolemy, and to have added something of his own on certain points. His work is reported to have been well received by both Hindus and Muhammadans: and the greater tables, of which the compilation was commenced in the following age, by Ben al Adamí and completed by Al Kásim, were raised upon the like foundation of Indian astronomy: and were long in general use among the Arabs, and by them deemed excellent. Another and earlier set of astronomical tables, founded on the Indian system called Sind-hind, was

compiled by Habash, an astronomer of Baghdad; who flourished in the time of the khalif Almámún.[1] Several others, similarly founded on the mean motions, furnished by the same Indian system, were published in the third century of the Hijra, or earlier: particularly those of Fazl ben Hátim Nárízí; and Al Hasan ben Misbáh.[2]

It was no doubt at the same period, while the Arabs were gaining a knowledge of one of the Indian systems of astronomy, that they became apprized of the existence of two others. No intimation at least occurs of any different specific time or more probable period, when the information was likely to be obtained by them, than that in which they were busy with the Indian astronomy, according to one of the three systems that prevailed among the Hindus; as the author of the Táríkhu'l hukamá, quoted by Casiri, affirms. The writer, whose compilation is of the twelfth century,[3] observes, that 'owing to the distance [511] of countries and impediments to intercourse, scarcely any of the writings of the Hindus had reached the Arabians. There are reckoned,' he adds, 'three celebrated systems (*mazhab*) of astronomy among them; namely *Sind* and *hind*; *A'rjabahar*, and *A'rkand*:[4] one only of which has been brought to us, namely, the *Sind-hind*: which most of the learned Muhammadans have followed.' After naming the authors of astronomical tables founded on that basis, and assigning the interpretation of the Indian title, and quoting the authority of Ben al Adamí, the compiler of the latest of those tables mentioned by him, he goes on to say, that 'of the Indian sciences no other communications have been received by us (Arabs), but a treatise on music, of which the title in Hindí is Biyáphar, and the signi-

[1] *Táríkhu'l hukamá*, Casiri, vol. i. pp. 426 and 428. Abú'lfaraj, ed. Pococke, 161.

[2] Casiri, vol. i. pp. 413 and 421.

[3] He flourished in 595 H. (A.D. 1198), as appears from passages of his work. MS. MDCCLXXIII. Lib. Esc. pp. 74 and 316. Casiri, vol. ii. p. 332.

[4] Casiri, vol. i. pp. 426 and 428. The *Kashfu'l zunún* specifies three astronomical systems of the Hindus under the same names.

fication of that title "fruit of knowledge;"[1] the work entitled Kalílah and Dimnah, upon ethics; and a book of numerical computation, which Abú Ja'far Muhammad ben Músa al Khuwárazmí amplified (*basat*), and which is a most expeditious and concise method, and testifies the ingenuity and acuteness of the Hindus.'

The book, here noticed as a treatise on ethics, is the well-known collection of fables of Pilpai or Bidpai (Sanskrit Vaidyapriya); and was translated from the Pehleví version into Arabic, by command of the same Abbasside Khalif Almansúr,[2] who caused an Indian astronomical treatise to be translated into the Arabian tongue. The Arabs, however, had other communications of portions of Indian science, which the author of the Táríkhu'l hukamá has in this place overlooked; especially upon medicine, on which [512] many treatises, general and particular, were translated from the Indian tongue. For instance, a tract upon poisons by Shanak (Sanskrit Charaka?), of which an Arabic version was made for the Khalif Almámún, by his preceptor 'Abbás ben Sa'íd Jauharí. Also a treatise on medicine and on materia medica in particular, which bears the name of Shashurd (Sanskrit Suśruta): and numerous others.[3]

The Khuwárazmite Muhammad ben Músa, who is named as having made known to the Arabians the Indian method of computation, is the same who is recognized by Arabian authors with almost a common consent (Zakaríya of Kasbín, etc.) as the first who wrote upon algebra. His competitor for the honour of priority is Abú Kámil Shujá' ben Aslam, surnamed the Egyptian arithmetician (Hásib al Miśrí); whose treatise on algebra was commented by 'Alí ben Ahmad al 'Amrání of

[1] Sans. *Vidyáphala*, fruit of science.

[2] Introd. Rem. to the *Hitopadeśa* [p. 148 of the present volume].

[3] D'Herbelot, Bibl. Orient. Ketab al samoun, Ketab Sendhaschat, Ketab al sokkar, Ketab Schaschourd al Hendi, Ketab Rai al Hendi, Ketab Noufschal al Hendi, Ketab al akakir, etc.

Muśalla;[1] and who is said by D'Herbelot to have been the first among learned Musulmans, that wrote upon this branch of mathematics.[2] The commentator is a writer of the tenth century; the date of his decease being recorded as of 344 H.[3] (A.D. 955). The age in which his author flourished, or the date of his text, is not furnished by any authority which has been consulted; and unless some evidence be found, showing that he was anterior to the Khuwárazmí, we may abide by the historical authority of Zakaríya of Kasbín; and consider the Khuwárazmí as the [513] earliest writer on algebra in Arabic. Next was the celebrated Alchindus (Abú Yúsaf Alkindí), contemporary with the astrologer Abú Ma'shar, in the third century of the Hijra and ninth of the Christian era,[4] an illustrious philosopher, versed in the sciences of Greece, of India, and of Persia, and author of several treatises upon numbers. In the prodigious multitude of his writings, upon every branch of science, one is specified as a tract on Indian computation (*Hisábu'l hindí*): others occur with titles which are understood by Casiri to relate to algebra, and to the 'finding of hidden numbers;' but which seem rather to appertain to other topics.[5] It is, however, presumable, that one of the works composed by him did treat of algebra as a branch of the science of computation. His pupil, Ahmad ben Muhammad of Sarkhas in Persia (who flourished in the middle of the third century of the Hijra, for he died in 286 H.), was author of a complete treatise of computation embracing algebra with arithmetic. About the same time a treatise of algebra was composed by Abú Hanífah Dainávarí, who lived till 290 H. (A.D. 903.)

[1] *Táríkhu'l hukamá*, Casiri, vol. i. p. 410.

[2] Bibl. Orient. 482. Also 226 and 494. No grounds are specified, Ibn Khalkán and Hájí Khalfah, whom he very commonly follows, have been searched in vain for authority on this point.

[3] *Tár*. Casiri, vol. i. p. 410.

[4] Abú'lfaraj; Pococke, p. 179.

[5] *Tárikhu'l hukamá;* Casiri, vol. i. pp. 353—360.

At a later period Abú'lwafá Buzjání, a distinguished mathematician, who flourished in the fourth century of the Hijra, between the years 348, when he commenced his studies, and 388, the date of his demise, composed numerous tracts on computation, among which are specified several commentaries on algebra: one of them on the treatise of the Khuwárazmite upon that subject: another on a less noticed treatise by Abú Yahyá, whose lectures he had attended: an interpretation (whether commentary or paraphrase may perhaps be doubted) of the work of Diophantus: demonstrations of the propositions contained [514] in that work: a treatise on numerical computation in general: and several tracts on particular branches of this subject.[1]

A question has been raised, as just now hinted, whether this writer's interpretation of Diophantus is to be deemed a translation or a commentary. The term which is here employed in the Táríkhu'l hukamá (*tafsír*, paraphrase,) and that which Abú'lfaraj uses upon the same occasion (*fassar*, interpreted,) are ambiguous. Applied to the relation between works in the same language, the term, no doubt, implies a gloss or comment; and is so understood in the very same passage where an interpretation of the Khuwárazmite's treatise, and another of Abú Yahyá's, were spoken of. But, where a difference of language subsists, it seems rather to intend a version, or at least a paraphrase, than mere scholia; and is employed by the same author in a passage before cited,[2] where he gives the Arabic signification of a Hindí term. That Buzjání's performance is to be deemed a translation, appears to be fairly inferable from the separate mention of the demonstration of the propositions in Diophantus, as a distinct work: for the latter seems to be of the nature of a commentary; and the other, consequently, is the more likely to have been a version, whether literal or partaking of paraphrase.

[1] *Táríkhu'l hukamá;* Casiri, vol. i. p. 433.

[2] *Ibid,* vol. i. p. 426, Art. Katka.

Besides, there is no mention, by an Arabian writer, of an earlier Arabic translation of Diophantus; and the Buzjání was not likely to be the commentator in Arabic of an untranslated book. D'Herbelot then may be deemed correct in naming him as the translator of the arithmetics of Diophantus; and Cossali, examining a like question, arrives at nearly the same conclusion; namely, that the Buzjání [515] was the translator, and the earliest, as well as the expositor, of Diophantus. (*Orig. dell' Alg.*, vol. i. p. 175.) The version was probably made soon after the date which Abú'lfaraj assigns to it, 348 H. (A.D. 969), which more properly is the date of the commencement of the translator's mathematical studies.

From all these facts, joined with other circumstances to be noticed in progress of this note, it is inferred, 1st, That the acquaintance of the Arabs with the Hindu astronomy is traced to the middle of the second century of the Hijra, in the reign of Almansúr, upon authority of Arabian historians citing that of the preface of ancient astronomical tables; while their knowledge of the Greek astronomy does not appear to have commenced until the subsequent reign of Hárún Arrashíd, when a translation of the Almajist is said to have been executed under the auspices of the Barmacide Yahyá ben Khálid, by Abú Hiyán and Salmá, employed for the purpose.[1] 2ndly, That they were become conversant in the Indian method of numerical computation within the second century; that is, before the beginning of the reign of Almámún, whose accession to the Khiláfat took place in 205 H. 3rdly, That the first treatise on algebra in Arabic was published in his reign; but their acquaintance with the work of Diophantus is not traced by any historical facts collected from their writings to a period anterior to the middle of the fourth century of the Hijra, when Abú'lwafá Buzjání flourished. 4thly, That Muhammad ben Músa Khuwárazmí, the same Arabic author

[1] Casiri, vol. i., p. 349.

who, in the time of Almámún, and before his accession, abridged an earlier astronomical work taken from the Hindus, and who published a treatise on the Indian method of numerical computation, is the first [516] also who furnished the Arabs with a knowledge of algebra, upon which he expressly wrote, and in that Khalif's reign, as will be more particularly shown as we proceed.

A treatise of algebra bearing his name, it may be here remarked, was in the hands of the Italian algebraists, translated into the Italian language, not very long after the introduction of the science into that country by Leonardo of Pisa. It appears to have been seen at a later period both by Cardan and by Bombelli. No manuscript of that version is, however, now extant; or at least known to be so.

Fortunately, a copy of the Arabic original is preserved the Bodleian collection.[1] It is the manuscript marked CMXVIII. Hunt. 214 folio, and bearing the date of the transcription 743 H. (A.D. 1342). The rules of the library, though access be readily allowed, preclude the study of any book which it contains, by a person not enured to the temperature of apartments unvisited by artificial warmth. This impediment to the examination of the manuscript in question has been remedied by the assistance of the under librarian, Mr. Alexander Nicoll, who has furnished ample extracts purposely transcribed by him from the manuscript. This has made it practicable to ascertain the contents of the book, and to identify the work as that in which the Khuwárazmí taught the principles of algebra; and consequently to compare the state of the science, as it was by him taught, with its utmost progress in the hands of the Muhammadans, as exhibited in an elementary work of not very ancient date, which is to this time studied among Asiatic Musulmans.

I allude to the *Khulásatu'l hisáb* of Baháu 'd dín, an author who lived between the years 953 and 1031 H. The

[1] [This was edited and translated by Rosen in 1831.]

Arabic text, with a Persian commentary, has been printed in Calcutta; and a summary of its contents had been pre-[517]viously given by Mr. Strachey in his "Early History of Algebra," in which, as in his other exertions for the investigation of Hindu and Arabian algebra, his zeal surmounted great difficulties, while his labours have thrown much light upon the subject.[1]

The title-page of the manuscript above described, as well as a marginal note on it, and the author's preface, all concur in declaring it the work of Muhammad ben Músa Khuwárazmí: and the mention of the Khalif Almámún in that preface establishes the identity of the author, whose various works, as is learned from Arabian historians, were composed by command, or with encouragement, of that Khalif, partly before his accession, and partly during his reign.

The preface, a transcript of which was supplied by the care of Mr. Nicoll, has been examined at my request by Colonel John Baillie. After perusing it with him, I am enabled to affirm, that it intimates "encouragement from the *Imám* Almámún, Commander of the Faithful, to compile a compendious treatise of calculation by algebra;" terms which amount not only to a disclaimer of any pretensions to the invention of the algebraic art, but which would, to my apprehension, as to that of the distinguished Arabic scholar consulted, strongly convey the idea of the pre-existence of ampler treatises upon algebra in the same language (Arabic), did not the marginal note above cited distinctly assert this to be "the first treatise composed upon algebra among the faithful,"—an assertion corroborated by the similar affirmation of Zakaríya of Kasbín, and other writers of Arabian history. Adverting, however, to that express affirmation, the author must be here under[518]stood as declaring that he compiled (*allaf* is the verb used by him) the treatise upon

[1] See Bíja Gaṇita, or Algebra of the Hindus, London, 1813; Hutton's Math. Dict., ed. 1815, Art. Algebra; and As. Res., vol. xii. p. 159.

algebra from books in some other language: doubtless, then, in the Indian tongue, as it has been already shown that he was conversant with Hindu astronomy, and Hindu computation and account.

It may be right to notice that the title of the manuscript denominates the author, Abú 'abdallah Muhammad ben Músa al Khuwárazmí, differing in the first part of the name from the designation which occurs in one passage of the *Táríkhu'l-hukamá,* quoted by Casiri, where the Khuwárazmí Muhammad ben Músa is called Abú Jaf'ar.[1] But that is not a sufficient ground for questioning the sameness of persons and genuineness of the work, as the Khuwárazmí is not usually designated by either of those additions, or by any other of that nature taken from the name of offspring: and error may be presumed, most probably on the part of the Egyptian author of the *Táríkhu'l-hukamá*, since the addition which he introduces, that of Abú Jaf'ar, belongs to Muhammad ben Músa ben Shákir, a very different person; as appears from another passage of the same Egyptian's compilation.[2]

The following is a translation of the Khuwárazmí's directions for the solution of equations, simple and compound, a topic which he enters upon at no great distance from the commencement of the volume, having first treated of unity and number in general.

'I found that the numbers, of which there is need in computation by restoration and comparison,[3] are of three kinds; namely, roots, and squares, and simple number relative to neither root nor square. A root is the whole of thing multiplied by [root] itself, consisting of unity, or [519] numbers ascending, or fractions descending. A square is the whole amount of root multiplied into itself; and simple number is the whole that is denominated by the number, without reference to root or square.

[1] Casiri, vol. i. p. 428.
[2] Casiri, vol. i. p. 418.
[3] *Hisábu'l jabr wa al mukábalah.*

'Of these three kinds, which are equal, some to some, the cases are these: for instance, you say "squares are equal to roots;" and "squares are equal to numbers;" and "roots are equal to numbers."

'As to the case in which squares are equal to roots; for example, "a square is equal to five roots of the same:" the root of the square is five; and the square is twenty-five: and that is equivalent to five times its root.

'So you say "a third of the square is equal to four roots:" the whole square then is equal to twelve roots; and that is a hundred and forty-four; its root is twelve.

'Another example: you say "five squares are equal to ten roots." Then one square is equal to two roots: and the root of the square is two; and the square is four.

'In like manner, whether the squares be many or few, they are reduced to a single square: and as much is done to the equivalent in roots; reducing it to the like of that to which the square has been brought.

'Case in which squares are equal to numbers: for instance, you say, "the square is equal to nine." Then that is the square, and the root is three. And you say, "five squares are equal to eighty:" then one square is a fifth of eighty; and that is sixteen. And, if you say, "the half of the square is equal to eighteen:" then the square is equal to thirty-six; and its root is six.

'In like manner, with all squares affirmative and negative, you reduce them to a single square. If there be less than a single square, you add thereto, until the square be quite complete. Do as much with the equivalent in numbers.

[520] 'Case in which roots are equal to number: for instance, you say, "the root equals three in number." Then the root is three; and the square, which is raised therefrom, is nine. And, if you say, "four roots are equal to twenty;" then a single root is equal to five; and the square, that is raised therefrom, is twenty-five. And, if you say, "the half

of the root is equal to ten:" then the [whole] root is equal to twenty; and the square, which is raised therefrom, is four hundred.

'I found that, with these three kinds, namely, roots, squares, and number compound, there will be three compound sorts [of equation]; that is, square and roots equal to number; squares and number equal to roots; and roots and number equal to squares.

'As for squares and roots, which are equal to number: for example, you say, "square, and ten roots of the same, amount to the sum of thirty-nine." Then the solution of it is: you halve the roots; and that in the present instance yields five. Then you multiply this by its like, and the product is twenty-five. Add this to thirty-nine: the sum is sixty-four. Then take the root of this, which is eight, and subtract from it half the roots, namely, five; the remainder is three. It is the root of the square which you required; and the square is nine.

'In like manner, if two squares be specified, or three, or less, or more, reduce them to a single square; and reduce the roots and number therewith to the like of that to which you reduced the square.

'For example, you say, "two squares and ten roots are equal to forty-eight *dirhams;*" and the meaning is, any two [such] squares, when they are summed, and unto them is added the equivalent of ten times the root of one of them, amount to the total of forty-eight *dirhams.* Then you must reduce the two squares to a single square: and [521] assuredly you know, that one of two squares is a moiety of both. Then reduce the whole thing in the instance to its half: and it is as much as to say, a square and five roots are equal to twenty-four *dirhams;* and the meaning is, any [such] square, when five of its roots are added to it, amounts to twenty-four. Then halve the roots, and the moiety is two and a half. Multiply that by its like, and the product is six and a quarter. Add this to twenty-four, the sum is thirty *dirhams*

and a quarter. Extract the root, it is five and a half. Subtract from this the moiety of the roots; that is, two and a half: the remainder is three. It is the root of the square: and the square is nine.

'In like manner, if it be said "half of the square and five roots are equal to twenty-eight *dirhams;*" it signifies, that, when you add to the moiety of any [such] square the equivalent of five of its roots, the amount is twenty-eight *dirhams*. Then you desire to complete your square so as it shall amount to one whole square; that is, to double it. Therefore double it, and double what you have with it; as well as what is equal thereunto. Then a square and ten roots are equal to fifty-six *dirhams*. Add half the roots multiplied by itself, twenty-five, to fifty-six; and the sum is eighty-one. Extract the root of this, it is nine. Subtract from this the moiety of the roots; that is, five: the remainder is four. It is the root of the square which you required: and the square is sixteen; and its moiety is eight.

'Proceed in like manner with all that comes of squares and roots; and what number equals them.

'As for squares and number, which are equal to roots; for example, you say, "a square and twenty-one are equal to ten of its roots:" the meaning of which is, any [such] square, when twenty-one *dirhams* are added to it, amounts [522] to what is the equivalent of ten roots of that square: then the solution is, halve the roots; and the moiety is five. Multiply this by itself; the product is twenty-five. Then subtract from it twenty-one, the number specified with the square: the remainder is four. Extract its root; which is two. Subtract this from the moiety of the roots; that is, from five: the remainder is three. It is the root of the square which you required: and the square is nine. Or, if you please, you may add the root to the moiety of the roots: the sum is seven. It is the root of the square which you required; and the square is forty-nine.

'When a case occurs to you which you bring under this head, try its answer by the sum: and, if that do not serve, it certainly will by the difference. This head is wrought both by the sum and by the difference. Not so either of the others of three cases requiring for their solution that the root be halved. And know, that, under this head, when the roots have been halved, and the moiety has been multiplied by its like, if the amount of the product be less than the *dirhams* which are with the square, then the instance is impossible: and, if it be equal to the *dirhams* between them, the root of the square is like the moiety of the roots, without either addition or subtraction.

'In every instance where you have two squares, or more or less, reduce to a single square, as I explained under the first head.

'As for roots and number, which are equal to squares: for example, you say, "three roots and four in number are equal to a square:" the solution of it is, halve the roots: and the moiety will be one and a half. Multiply this by its like, [the product is two and a quarter. Add it to four, the sum is six and a quarter. Extract the root, which is two and a half. To this add the moiety of the [523] roots: the sum is four. It is the root of the square which you required: and the square is sixteen.]'

The author returns to the subject in a distinct chapter, which is entitled, "On the six cases of Algebra." A short extract from it may suffice.

'The first of the six cases. For example, you say, "you divide ten into two parts, and multiply one of the two parts by the other: then you multiply one of them by itself, and the product of this multiplication into itself is equal to four times that of one of the parts by the other."

'Solution. Make one of the two parts *thing*, and the other ten less *thing:* then multiply *thing* by ten less *thing*, and the product will be ten *things* less a square. Multiply by four;

for you said "four times:" it will be four times the product of one part by the other; that is, forty *things* less four squares. Now multiply *thing* by *thing*, which is one of the parts by itself: the result is, square equal to forty *things* less four squares. Then *restore* it in the four squares, and add it to the one square. There will be forty *things* equal to five squares; and a single square is equal to eight roots. It is sixty-four; and its root is eight: and that is one of the two parts, which was multiplied into itself: and the remainder of ten is two; and that is the other part. Thus has this instance been solved under one of the six heads: and that is the case of squares equal to roots.

'The second case. "You divide ten into two parts, and multiply the amount of a part into itself. Then multiply ten into itself; and the product of this multiplication of ten into itself, is equivalent to twice the product of the part taken into itself, and seven-ninths: or it is equivalent to six times and a quarter the product of the other part taken into itself."

'Solution. Make one of the parts *thing*, and the other [524] ten less *thing*. Then you multiply *thing* into itself: it is a square. Next by two and seven-ninths: the product will be two squares, and seven-ninths of a square. Then multiply ten into itself, and the product is a hundred. Reduce it to a single square, the result is nine twenty-fifths; that is, a fifth and four-fifths of a fifth. Take a fifth of a hundred and four-fifths of a fifth; the quotient is thirty-six, which is equal to one square. Then extract the root, which is six. It is one of the two parts; and the other is undoubtedly four. Thus you solve this instance under one of the six heads: and that is "squares equal to number."'

These extracts may serve to convey an adequate notion of the manner in which Khuwárazmí conducts the resolution of equations simple and compound, and the investigation of problems by their means. If a comparison be made with the *Khulásatu'l hisáb*, of which a summary by Mr. Strachey will

be found in the Researches of the Asiatic Society,[1] it may be seen that the algebraic art has been nearly stationary in the hands of the Muhammadans, from the days of Muhammad of Khuwárazm[2] to those of Baháu 'd dín of 'Ámul,[3] notwithstanding the intermediate study of the arithmetics of Diophantus, translated and expounded by Muhammad of Buzján. Neither that comparison, nor the exclusive consideration of the Khuwárazmí's performance, leads to any other conclusion, than, as before intimated, that, being conversant with the sciences of the Hindus, especially with their astronomy and their method of numerical calculation, and being the author of the earliest Arabic treatise on algebra, he must be deemed to have learnt from the Hindus the resolution of simple and quadratic equations, or, in short, algebra, a branch of their art of computation.

[525] The conclusion, at which we have arrived, may be strengthened by the coincident opinion of Cossali, who, after diligent research and ample disquisition, comes to the following result.[4]

'Concerning the origin of algebra among the Arabs, what is certain is, that Muhammad ben Músa, the Khuwárazmite, first taught it to them. The Kasbínian, a writer of authority, affirms it; no historical fact, no opinion, no reasoning, opposes it.

'There is nothing in history respecting Muhammad ben Músa individually, which favours the opinion, that he took from the Greeks the algebra which he taught to the Muhammadans.

'History presents in him no other than a mathematician of a country most distant from Greece and contiguous to India, skilled in the Indian tongue, fond of Indian matters, which he translated, amended, epitomized, adorned: and he it was,

[1] Vol. xii. [2] On the Oxus.

[3] A district of Syria; not Ámul, a town in Khurásán. Com.

[4] *Orig. dell' Alg.*, vol. i. p. 216.

who was the first instructor of the Muhammadans in the algebraic art.[1]

'Not having taken algebra from the Greeks, he must have either invented it himself, or taken it from the Indians. Of the two, the second appears to me the most probable.'[2]

O.

Communication of the Hindus with Western Nations on Astrology and Astronomy.

The position, that Astrology is partly of foreign growth in India; that is, that the Hindus have borrowed, and largely too, from the astrology of a more western region, [526] is grounded, as the similar inference concerning a different branch of divination,[3] on the resemblance of certain terms employed in both. The mode of divination, called Tájaka, implies by its very name its Arabian origin. Astrological prediction by configuration of planets, in like manner, indicates even by its Indian name a Grecian source. It is denominated Horá, the second of three branches which compose a complete course of astronomy and astrology:[4] and the word occurs in this sense in the writings of early Hindu astrologers. Varáhamihira, whose name stands high in this class of writers, has attempted to supply a Sanskrit etymology; and in his treatise on casting nativities derives the word from Ahorátra, day and night, a nycthemeron. This formation of a word by dropping *both* the first and last syllables, is not conformable to the analogies of Sanskrit etymology. It is more natural, then, to look for the origin of the term in a foreign tongue: and that is presented by the Greek *ὥρα* and its derivative *ὡροσκόπος*, an

[1] *Orig. dell' Alg.*, vol. i. p. 219.
[2] See his reasons at large.
[3] As. Res., vol. ix. p. 366 (p. 320 of the present volume). [Cf. Weber's excellent paper on Indian Astrology in *Indische Studien*, ii. pp. 236–287.]
[4] See note K.

astrologer, and especially one who considers the natal *hour*, and hence predicts events.[1] The same term *horá* occurs again in the writings of the Hindu astrologers, with an acceptation (that of hour[2]) which more exactly conforms to the Grecian etymon.

The resemblance of a single term would not suffice to ground an inference of common origin, since it might be purely accidental. But other words are also remarked in Hindu astrology, which are evidently not Indian. An instance of it is *dreshkáṇa*,[3] used in the same astrological sense with the Greek δεκανὸς and Latin *decanus:* words, which, notwithstanding their classic sound, are to be considered as of foreign origin (Chaldean or Egyptian) in the [527] classic languages, at least with this acceptation. The term is assuredly not genuine Sanskrit: and hence it was before[4] inferred, that the particular astrological doctrine, to which it belongs, is exotic in India. It appears, however, that this division of the twelve zodiacal signs into three portions each, with planets governing them, and pourtrayed figures representing them, is not implicitly the same among the Hindu astrologers, which it was among the Chaldeans, with whom the Egyptians and Persians coincided. Variations have been noticed.[5] Other points of difference are specified by the astrologer of Balkh;[6] and they concern the allotment of planets to govern the *decani* and *dreshkáṇas,* and the figures by which they are represented. Abú Maʿshar is a writer of the ninth century;[7] and his notice of this astrological division of the zodiac as received by Hindus, Chaldeans, and Egyptians, confirms the fact of an earlier communication between the Indians and the Chaldeans, perhaps the Egyptians, on the subject of it.

1 Hesych. and Suid.

2 As. Res., vol. v. p. 107.

3 As. Res., vol. ix. p. 367 (p. 320 of the present volume).

4 As. Res., vol. ix. p. 367 and 372 (p. 320 of the present volume). Vide Salm. *Exerc. Plin.*

5 *Ibid.*, vol. ix. p. 374 (p. 326 of the present volume).

6 Lib. intr. in Ast. Albumasis Abalachi, pp. 5, 12, and 13.

7 Died in in 272 H. (885 C.) aged a hundred.

With the sexagesimal fractions, the introduction of which is by Wallis ascribed to Ptolemy among the Greeks,[1] the Hindus have adopted for the minute of a degree, besides a term of their own language, *kalá*, one taken from the Greek λεπτὰ, scarcely altered in the Sanskrit *liptá*. The term must be deemed originally Greek, rather than Indian, in that acceptation, as it there corresponds to an adjective λεπτὸς, slender, minute: an import which precisely agrees with the Sanskrit *kalá* and Arabic *daḳiḳ*, fine, [528] minute; whence, in these languages respectively, *kalá* and *daḳiḳ* for a minute of a degree. But the meanings of *lipta* in Sanskrit[2] are, 1st, smeared; 2nd, infected with poison; 3rd, eaten: and its derivative *liptaka* signifies a poisoned arrow; being derived from *lip*, to smear: and the dictionaries give no interpretation of the word that has any affinity with its special acceptation as a technical term in astronomy and mathematics. Yet it occurs so employed in the work of Brahmagupta.[3]

By a different analogy of the sense and not the sound, the Greek μοῖρα, a part, and specially a degree of a circle, is in Sanskrit *anśa*, *bhága*, and other synonyma of part, applied emphatically in technical language to the 360th part of the periphery of a circle. The resemblance of the radical sense, in the one instance, tends to corroborate the inference from the similarity of sound in the other.

Kendra is used by Brahmagupta and the Súrya-siddhánta, as well as other astronomical writers (Bháskara, etc.), and by the astrologers Varáhamihira and the rest, to signify the equation of the centre.[4] The same term is employed in the Indian mensuration for the centre of a circle;[5] also denoted by *madhya*, middle. It comes so near in sound, as in signification, to the Greek κέντρον, that the inference of a common origin for these words is not to be avoided. But in Sanskrit

[1] Wallis, Alg. c. 7. [2] *Am. Kosh.* [3] C. i., § 6, *et passim.*
[4] *Brahm. siddh.* c. 2. *Súr. siddh.* c. 2. *Vṛihat* and *Laghu Játakas.*
[5] *Súr.* on *Lil.* § 207.

it is exclusively technical; it is unnoticed by the vocabularies of the language; and it is not easily traced to a Sanskrit root. In Greek, on the contrary, the correspondent term was borrowed in mathematics from a familiar word signifying a goad, spur, thorn, or point; and derived from a Greek theme *κεντέω*.[1]

[529] The other term, which has been mentioned as commonly used for the centre of a circle, namely, *madhya*, middle, is one of the numerous instances of radical and primary analogy between the Sanskrit and the Latin and Greek languages. It is a common word of the ancient Indian tongue; and is clearly the same with the Latin *medius;* and serves to show that the Latin is nearer to the ancient pronunciation of Greek, than *μέσος*; from which Sipontinus[2] derives it, but which must be deemed a corrupted or softened utterance[3] of an ancient term coming nearer to the Sanskrit *madhyas* and Latin *medius*.

On a hasty glance over the *játakas*, or Indian treatises upon horoscopes, several other terms of the art have been noticed, which are not Sanskrit, but apparently barbarian. For instance, *anaphá, sunaphá, durudhará,* and *kemadruma,* designating certain configurations of the planets. They occur in both the treatises of Varáhamihira; and a passage, relative to this subject, is among those quoted from the abridgment by the scholiast of the greater treatise, and verified in

[1] [Kern gives a list of thirty-six Greek words which occur in Varáhamihira's Vṛihat Sanhitá (cf. Weber, *Indische Studien*, ii. 254, 260). The signs of the Zodiac (except Cancer), Kriya, Távuri, Jituma, Leya, Páthena, Dyúka or Júka, Kaurpya, Taukshika, Ákokera, Hṛidroga, Ittham;—Heli (ἥλιος) Himna (Ἑρμῆς), Ára (Ἄρης), Jyau (Ζεύς), Koṇa (Κρόνος), Ásphujit (Ἀφροδίτη), horá, kendra, dreshkáṇa or drekkáṇa, liptá, anaphá (ἀναφή), sunaphá (συναφή), durudhará (δορυφορία), kemadruma (χρηματισμός), vesï (φάσις), ápoklima (ἀπόκλιμα), paṇaphara (ἐπαναφορά), hibuka (ὑπόγειον), jámitra (διάμετρος), meshúraṇa (μεσουράνημα), dyunam or dyutam (δυτικόν?), riḥpha (ῥιφή), and harija (ὁρίζων).

[2] Pyrrhi Perotti, *Episcopi Sipontini, Cornucopiæ sive Linguæ Latinæ Commentarii*, col. 1019, edit. Ald. 1527, fol.

[3] ["Μέσσος steht für *μεθ-j-ος*, *μέσος* ist weiter abgeschwächt."—Curtius, *Grundzüge*, p. 310.]

the text of the less.[1] The affinity of those terms to words of other languages used in a similar astrological sense, has not been traced; for want, perhaps, of competent acquaintance with the terminology of that silly art. But it must not be passed unremarked, that Varáhamihira, who has in another place praised the Yavanas for their proficiency in astrology (or astronomy, for the term is ambiguous), frequently quotes them in his great treatise on horoscopes; and his scholiast marks a distinction between the ancient Yavanas, whom he cha[530]racterizes as "a race of barbarians conversant with (*horá*) horoscopes," and a known Sanskrit author bearing the title of Yavaneśwara, whose work he had seen and repeatedly cites; but the writings and doctrine of the ancient Yavanas, he acknowledges, had not been seen by him, and were known to him only by this writer's and his own author's references.

No argument, bearing upon the point under consideration, is built on Bháskara's use of the word *dramma* for the value of sixty-four cowry-shells (*Lil.* § 2) in place of the proper Sanskrit term *pramáṇa,* which Śrídhara and other Hindu authors employ; nor on the use of *dinára,* for a denomination of money, by the scholiast of Brahmagupta (12, § 12) who also, like Bháskara, employs the first-mentioned word (12, § 14): though the one is clearly analogous to the Greek *drachma,* a word of undoubted Grecian etymology, being derived from δράττομαι; and the other apparently is so, to the Roman *denarius,* which has a Latin derivation. The first has not even the Sanskrit air; and is evidently an exotic, or, in short, a barbarous term. It was probably received mediately through the Muhammadans, who have their *dirham* in the like sense. The other is a genuine Sanskrit word, of which the etymology, presenting the sense of 'splendid,' is consistent with the several acceptations of a specific weight of gold; a golden ornament or breast-piece;

[1] See p. 435. Another passage so quoted and verified uses the term *kendra* in the sense above mentioned.

and gold money: all which senses it bears, according to the ancient vocabularies of the language.[1]

The similarity seems then to be accidental in this instance; and the Muhammadans, who have also a like term, may have borrowed it on either hand; not improbably from the Hindus, as the *dínár* of the Arabs and Persians is [531] a gold coin like the Indian; while the Roman *denarius* is properly a silver one. D'Herbelot assigns as a reason for deriving the Arabic *dínár* from the Roman *denarius*, that this was of gold. The nummus aureus sometimes had that designation; and we read in Roman authors of golden as well as silver *denarii.*[2] But it is needless to multiply references and quotations to prove, that the Roman coin of that name was primarily silver, and so denominated because it was equal in value to ten copper *as;*[3] that it was all along the name of a silver coin;[4] and was still so under the Greek empire, when the δηνάριον was the hundredth part of a large silver coin termed ἀργυροῦς.[5]

[1] *Amara kosha,* etc. [The Uṇádi Sútras give a rule (iii. 140) for the formation of *dínára,* but Ujjwaladatta in his Comm. expressly states that the rule was wanting in two of the earlier commentaries.]

[2] Plin. 33, § 13, and 37, § 3. Petron. Satyr. 106, 160.

[3] Plin. 33, § 13, Vitr. 3, 1, Volus. Mæcianus, Didymus.

[4] Vitr. and Vol. Mæc.

[5] Epiphanius, cum multis aliis.

[From Mr. Colebrooke's researches into the ancient astronomy and algebra of the Hindus, he was led to suspect that in astrology they borrowed largely from the Greeks. To this conclusion he arrived chiefly on philological evidence, the terms employed in their books being derived in some cases from the Arabs, but still more from the Greeks. This view he considered perfectly consistent with the supposition that the belief in the influence of the stars was part of their ancient religion, and that this so-called science was of considerable antiquity. Had he thought the subject worthy of research, he would not have failed to have supported the former view with very powerful reasons. The terminology of this "silly art," as he terms it, affords stronger traces of its Grecian origin than he has pointed out. Of some of the words specified by him, of which he has failed to trace the origin, two are evidently derived from the Greek. The word *anaphá* claims kindred with ἀναφορά 'rising,'—a word frequently used by Sextus Empiricus. *Sunaphá* is derived from the Greek word for 'conjunctions.' The title of a chapter of the Τετράβιβλος of

Ptolemy is *περὶ συναφῶν καὶ ἀποῤῥοιῶν*, 'Concerning Conjunctions and Influences. (Delambre ii., cap. 19.) Sir George Lewis, in his 'Survey of the Astronomy of the Ancients,' has elucidated the early history of astrology with great learning, and has proved, I think, very conclusively, that the practice of divination from stars and planets was of great antiquity, and introduced into the Roman Empire and Egypt by the Chaldeans; but that it owed its extraordinary popularity and success to the engrafting upon the old rude methods something of the scientific astronomy of the Greeks. From this time it spread rapidly over the Roman Empire, was cultivated in Egypt by the Arabs, and from thence spread over Western Europe in spite of prohibitory laws of the Roman Government and strong opposition of the Christian Church. It is in this modern form of genethlialogy, or judicial astronomy, that it has enjoyed the same extraordinary popularity in India, and it would be perfectly consistent with all that we know of the history of Indian astronomers, to suppose that they derived their knowledge of the false science from the same source; but this in no way invalidates the supposition that the study of astronomy with a view to divination may have been cultivated in more ancient times.—Sir T. E. C.]

ADDITIONAL NOTES TO THE FIRST VOLUME OF THE ESSAYS.

Page 117, *line* 31. But cf. the Mádhyandina version, x. 6, 4, 5.

Page 118, *last line*. Add "Ind. Stud. xii. 350 sq."

Page 131, *line* 27. Add "Ind. Stud. ix. 424 sq.; x. 213 sq."

Page 210, *line* 10. Dr. Hall has shown, in his *Rational Refutation*, pp. 196, 212, that Śankara-áchárya and his followers held Vishṇu to be the Supreme Spirit; cf. A. C. Burnell's preface to his edition of the *Vaṅśa-bráhmaṇa*, 1873.

Page 316, *line* 21. Another form of the negative argument is as follows. We have first the affirmative argument "the mountain has fire because it has smoke," and, from this, "the lake has the absence of smoke because it has the absence of fire." But the mountain has the absence of the absence of fire because it has the absence of the absence of smoke, or, in other words, "the mountain *is different* from the lake because it has smoke." In the same way we may prove that, as earth has earthiness because it has smell (smell being only found where earthy particles are), "earth *is different* from other things, as water, etc., because it has smell."

ADDITIONAL NOTES TO VOL. II.

Page 38, *line* 6. Since this portion was printed, the *Mahábháshya*, with Kaiyaṭa's commentary, has been published in Benares. Prof. Weber has published in *Ind. Stud.* vol. xiii., a valuable article on its importance for Indian literary history.

Page 159, *line* 16. A note was inadvertently omitted here to suggest the correction of 'Ráḍa' to 'Ráḍhá.'

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[*Where an article entirely consists of references to the first volume, only the pages are given. Titles of books are printed in italics.*]

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